XICIMFAUNA

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"Alternative Sustainable Conservation & Utilization Methods

"Conservacion y Methodos de Utilizacion Alternativos y Sostenibles para los Animales Neo-tropicales"

"Alternativas Sustentáveis Métodos de Conservação e Utilização de Animais Neo-tropicais"

2014 Trinidad and Tobago

LIVRO DE RESUMOS
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I would like to inform All COMFAUNA members and XICIMFAUNA participants that this book of abstracts is a work in progress. Up dated versions would be posted on the XICIMFAUNA website. If your abstract is not on please email the information to the following: xicimfauna.abstracts@gmail.com prof.gary.garcia@gmail.com and the Book of Abstracts will be updated on the website.

Gary Wayne Garcia
President XICIMFAUNA
August 2014

Ponencias Magistrales/ Palestras Magnas/Expert Lectures

Ponencia Magistral/Palestra Magna/Expert Lecture #1
Professor Sérgio Luiz Gama Nogueira Filho
Professor of Wildlife Management
Departamento de Ciências Agrárias e Ambientais,
Universidade Estadual de Santa Cruz, Ilheus, Bahia, Brazil
Intensive and semi-intensive production systems as a method of conservation of Neo-tropical animals

Ponencia Magistral/Palestra Magna/Expert Lecture #2

Dr. José Manuel Vieira Fragoso, B.Sc., MSc., Ph.D. U of Florida
Senior Scientist, Department of Biology, Stanford University, USA

Sustainability of vertebrate animals, forest cover and humans in human inhabited protected areas when outside forests are eliminated

What happens to animal diversity, distribution and abundance and forest cover inside protected areas inhabited by humans as human populations grow? What happens to forest cover and the livelihoods of people inside these protected areas when outside lands are converted to soybean fields or flooded by dam building? What happens to the human inhabitants of these protected areas when human populations grow, when child mortality decreases because of improved health care or when human inhabitants receive welfare from government, as occurs in programs such as Bolsa Verde or Bolsa Familia in Brazil? How do all these factors interact and synergize to affect all aspects of this coupled human-environmental system? What happens to the sustainability of these systems when lands outside are cleared of forests? We explore responses to these questions using a novel computer simulation program developed by our research group. This program explores these questions using an example of indigenous people and their land. This model has been validated using extensive field data sets. The program allows the examination of how the aforementioned factors alter the environment and human livelihoods in isolation and synergistically when these factors interact. The model also considers feedbacks amongst all variables. This is a powerful new tool for those interested in land, biodiversity and forest management in natural areas inhabited by humans.

José Manuel Vieira Fragoso is a Senior Scientist in the Biology Department at Stanford University, USA. He has worked and lived in Amazonia for about 25 years. His early work included field studies of white-lipped peccaries, tapirs and tortoises as well as other species. In addition he has published extensively on how seed dispersal and predation influences tropical forest structure. Presently he conducts research that seeks to understand human-environment interactions in protected and non-protected areas. He also helps policy makers in their decision-making concerning the environment. You can view more information and his publications at www.stanford.edu/group/fragoso/index.html. He can be contacted at fragoso@stanford.edu.

Ponencia Magistral/Palestra Magna/Expert Lecture #3
Dr. Richard Bodmer, B.Sc, Ph.D. Cambridge
Reader in Conservation Ecology
School of Anthropology and Conservation
Durrell Institute of Conservation and Ecology [DICE]
University of Kent, Canterbury, Kent
UK

The Impact of climate change on wildlife in the Peruvian Amazon

Recent IPCC-AR4 climate change models of Amazonia predict that the western Amazon in general will convert to wetter conditions with greater probability of flooding intermittent with occasional droughts. The concordance between recent climate fluctuations in the Peruvian Amazon and the models allows for an analysis of what is likely to happen in the future if the models are correct. This talk examines the impact of climate change on wildlife and people in the flooded forests of the Peruvian Amazon in the Pacaya Samiria National Reserve. Flooded forests are particularly important at understanding impacts of climate change in the Amazon, since the aquatic and terrestrial interface between high and low water seasons makes this habitat sensitive to greater seasonal variations in water level change. Results of the research conducted in the Samiria River show that populations of pink river dolphins were negatively impacted by droughts and grey river dolphins by intensive floods. Fish populations had greater mortality during the drought and aquatic bird populations suffered as a consequence of smaller fish populations.
Recent intensive flooding events in the Amazon basin have resulted in an unprecedented reduction in peccary, deer, paca, agouti and terrestrial edentate populations in flooded forests as a result of fewer and smaller levees. Tapir populations have survived better than predicted. Animal species that have arboreal or semi arboreal habits can escape the physical effects of flooding and are better adapted to the intensive inundations caused by climate change. Wildlife species such as macaws, primates, other arboreal mammals and game birds are all able to avoid the direct impact of flooding and their populations have remained healthy. Predators have increased due to greater densities of prey on smaller levees during intensive flooding. Animals that have both aquatic and terrestrial habits have maintained healthy populations, since they can cope both with droughts and floods.

Local Kukama-Kukamiria Indigenous people living in the Samiria River basin are being negatively impacted by the greater water level variations of recent years. The bush meat hunting has decreased substantially from declining ungulate and rodent populations, and has become less sustainable. During the drought the size of many common species became smaller and people had to capture more fish for the same level of protein. Climate change is impacting the Kukama-Kukamiria of the flooded forest on many different levels of their livelihoods. The impacts of climate change now present another challenge for the local people and the conservation of the Amazon forests.

Ponencia Magistral/Palestra Magna/Expert Lecture #4

Dr. Natália Inagaki de Albuquerque, DVM, M.Sc., Ph.D
Research Scientist
Empresa Brasileira de Pesquisa Agropecuária, Embrapa Amazônia Oriental, CPA, Belem, Para, Brazil

Production System of Collared Peccary [*Pecari tajacu*]- Research Results of Intensive Systems for Production and Ex-situ Conservation

Ponencia Magistral/Palestra Magna/Expert Lecture #5

Prof. Hilma Lucia Tavares Dias, DVM, M.Sc., Ph.D
Núcleo de Ciências Agrárias e Desenvolvimento Rural
Universidade Federal do Pará, Belém, Para - Brasil

ISOLATION AND ANTIMICROBIAL RESISTANCE OF MICROORGANISMS IN THE WILD AMAZON REGION

Ponencia Magistral/Palestra Magna/Expert Lecture #6

Dr. Wendy R. Townsend, B.Sc., MSc., Ph.D. U of Florida

NEOTROPICAL WILDLIFE: THE STARTING POINT FOR SUSTAINABLE AND INTEGRAL DEVELOPMENT FOR INDIGENOUS PEOPLE IN LATIN AMERICA
[LA FAUNA SILVESTRE NEOTROPICAL: PUNTO DE PARTIDA PARA EL DESARROLLO SOSTENIBLE Y INTEGRAL DE LOS PUEBLOS INDIGENA EN AMERICA LATINA]

The importance of the **Neotropical wildlife** to indigenous peoples has been widely documented. This importance stems not only in terms of the nutritional value, but also for the cultural significance. For millennia wildlife has provided raw material for tools, useful household, ornaments, clothing, medicines, social cohesion and the inspiration for history, beliefs and ceremonies. Game meat, or the lack thereof, has been blamed for causing wars, seasonal nomadism, competition over women, and the abandonment of entire communities when residents are forced to seek richer hunting areas. Wildlife is the epicenter of the cultural continuity and wildlife protein has been the source of survival for many indigenous people. Subsistence hunters are impacted directly when changes are made in land use around their territories. Several authors have shown that the game harvest changes in quality and quantity according to the environmental conditions of the areas hunted. For this reason, it is crucial to consider wild fauna as a main element in development plans of the Amazon. Without planning for sufficient space to safeguard the production of wild fauna, it is unlikely that there can be sustainable or integral development as proposed in several international plans such as the "**guidelines for food sovereignty**" **(FAO)** or the "**mechanism set of mitigation and adaptation for the management Integral and sustainable of the Bosque and the mother earth**" **as proposed by UNEP**. Since the wildlife is fundamental to many cultures of Latin America, indigenous peoples have many reasons to want to take care of their game animals. **Participatory research (citizen science)** is an activity that is well received by indigenous peoples, especially when such research has to do with wildlife. The tools and experiences shared in this presentation manifest power of participatory wildlife management to foster

community discussion on territorial management that is sustainable and integral. Experience has shown that voluntary efforts of self-registration of hunting results can empower a community in search of its own choice for sustainable development, one that coexists with their culture.

Ponencia Magistral/Palestra Magna/Expert Lecture #7
Mariano Browne, B.Sc. (Econ UWI), ACCA, MBA
WHAT ARE THE FINANCIAL AND ECONOMIC ISSUES THAT MUST BE ADDRESSED FOR THE SUSTAINABLE CONSERVATION, PRODUCTION AND UTILIZATION OF NEO-TROPICAL ANIMALS [BOTH TERRESTRIAL AND AQUATIC?]

THEMATIC AREAS [As posted on the XICIMFAUNA Website – xicimfauna.org]

PLEASE NOTE: Not all the areas would have sessions due to limited or no submissions in these areas.

DESCRIPTION OF PAPER CODES

2:1&3:1

Working Session: Thematic Area/s: Paper

A. Management for the Conservation of Utilized species

[Management for the conservation of species that are subjected some kind of use]

1. Management for the conservation of **Avian species**

2:1&3:1
Title: **AVES, TURISMO Y CONSERVACIÓN EN BARRA DE POTOSÍ, GUERRERO, MÉXICO**
[BIRDS, TOURISM AND CONSERVATION IN BARRA DE POTOSÍ, GUERRERO MEXICO]
Author(s): Alejandro Meléndez-Herrada, Ana Luisa Figueroa-Fernández, Falco Manuel García-González y Elisa Vázquez-Suaste
Email: meha1789@correo.xoc.uam.mx
Country: Mexico
Abstract:
Spanish

El Estado de Guerrero se encuentra al norte del neotrópico, en el Pacífico sur mexicano, y es uno de los cuatro estados más biodiversos del país.

Guerrero tiene una línea de costa equivalente o superior a la de seis países de América Latina, lo que resalta la importancia de su conservación. Barra de Potosí es una localidad en el litoral norte del Estado y se encuentra cerca de dos destinos turísticos internacionales, Ixtapa-Zihuatanejo y Acapulco. Los ambientes costeros de la zona se encuentran muy cercanos, favoreciendo a una amplia variedad de aves en un área relativamente pequeña, siendo un atractivo turístico además de sus paisajes y servicios rústicos. Se monitorearon aves con base en observación directa y captura durante cinco años y se compararon las comunidades con el índice de similitud de Jaccard, en manglar-laguna, selva baja caducifolia, matorral xerófilo y cultivos arbóreos; como complemento, se documentaron otros grupos faunísticos utilizando técnicas particulares. A la información colectada en campo se le añadió con literatura disponible. En esta investigación se registraron 216 especies de aves (76% de todo el Estado), 83 de estas especies fueron acuáticas. Al comparar las avifaunas de los hábitats, se delimitó al manglar-laguna como el más rico en especies, seguido de los cultivos, selva baja y matorral xerófilo. Al menos 20 especies se encuentran protegidas por las leyes mexicanas. La similitud entre las comunidades tiende a ser baja, lo que sugiere una complementación entre todas para mantener la diversidad total de la región, tanto para la conservación ecológica como para su uso en el ecoturismo (birdwatching). Como parte del sistema, a 3.5 km mar adentro se encuentran siete islotes conocidos como los Morros, de gran importancia para aves marinas, donde se alojan hasta 10,000 individuos que ahí descansan y se reproducen. En todos los ambientes se encuentran especies raras, endémicas, migratorias y en riesgo. La congregación de aves como cormoranes, pelícanos, fregatas, bobos y gaviotas atrae a los visitantes nacionales; sin embargo, especies raras y endémicas son las apreciadas por extranjeros. Como complemento a esta investigación, se han documentado 382 especies de plantas vasculares y 122 de microalgas, 188 de mariposas diurnas, 68 de peces, tres de anfibios y 18 de reptiles (cuatro de tortugas marinas), 113 de mamíferos (17 marinos), entre otras. Aunque se reconoce el valor ecológico de la zona, ésta carece de protección oficial y el mal manejo del agua y las actividades antrópicas que se desarrollan sin regulación estricta ponen en riesgo al medio natural. Adicionalmente, existe un fuerte interés por acondicionar la zona para un desarrollo turístico convencional a gran escala y en términos de seguridad, también se debe considerar que actualmente en Guerrero se presenta violencia muy por encima de la media mundial. Aun con este panorama preocupante, que complica implementar medidas de conservación, actualmente se están llevando a cabo gestiones con el gobierno mexicano para que la zona sea incluida dentro del Sistema Nacional de Áreas Naturales Protegidas. Esto adquiere mayor relevancia cuando la costa de Guerrero está casi desprotegida.

English

The State of Guerrero is located north of the neotropics% 2C in the south Pacific mexican% 2C and is one of the four states of the country most biodiverse. Guerrero has a coast line of equivalent or superior to that of six countries in Latin America% 2C which underscores the importance of their conservation. Barra de Potosí is a village in the north coast of the State and is close to two international tourist destinations% 2C Ixtapa

Zihuatanejo and Acapulco. The coastal environments of the area are found very close% 2C by favoring a wide variety of birds in a relatively small area% 2C being a tourist attraction in addition to their landscapes and rustic services. Birds were monitored based on direct observation and scan for five years and the communities were compared with the index of Jaccard similarity% 2C in mangrove-laguna% 2C low deciduous forest% 2C xeric scrublands and tree crops% 3B as a complement% 2C were documented other faunal groups using particular techniques. The information collected in the field was added with available literature. In this investigation were recorded 216 species of birds (76% of the entire State) % 2C 83 of these species were aquatic. When comparing the avifaunas of the habitats% 2C was staked to the mangrove-lagoon as the richest in species% 2C followed by the crops% 2C low jungle and xeric scrublands. At least 20 species are protected by Mexican law. The similarity between communities tends to be low% 2C which suggests a complementarity between all to maintain the diversity of the region's total% 2C for both ecological conservation as to its use in the ecotourism (birdwatching). As part of the system% 2C at 3.5 km offshore are seven islets known as the Morros% 2C of great importance for seabirds% 2C where they are housed up to 10 % 2C000 individuals that there and rest are reproduced. In all the environments are rare species endemic% 2C% 2C migratory and at risk. The congregation of birds such as cormorants pelicans% 2C% 2C% 2C frigate bobos and seagulls attracts visitors national% 3B however% 2C rare and endemic species are appreciated by foreigners. As a complement to this research% 2C have been documented 382 species of vascular plants and 122 of microalgae% 2C 188 of diurnal butterflies% 2C 68 fish% 2C three amphibians and 18 reptiles (four of marine turtles) % 2C 113 of mammals (17 marine) % 2C among others. Although it is recognized the ecological value of the area% 2C it lacks official protection and mismanagement of the water and the anthropic activities that are carried out without strict regulations put in risk to the natural environment. Additionally% 2C there is a strong interest in condition the area for a conventional tourism development to large-scale and in terms of security% 2C you should also consider that currently occurs in Guerrero violence well above the global average. Even with this disturbing picture% 2C which complicates implement conservation measures% 2C currently efforts are under way with the Mexican government so that the area be included in the National System of Protected Natural Areas. This takes on greater significance when the coast of Guerrero is almost unprotected.

2:1&3:2

Title: **DATOS PRELIMINARES DEL ESTADO POBLACIONAL DEL PIURÍ Ó PAVÓN CARUNCULADO *Crax globulosa* EN LA RESERVA DE DESARROLLO SOSTENIBLE PIAGAÇU-PURUS (RDS-PP), BAJO RIO PURUS, BRASIL**

Author(s): Carolina Bertsch, Francisco das Chagas Amaro da Silva y Bastos Laranjeiras, Francisco
Email:
Country: Brazil

Abstract:

El Piurí *Crax globulosa* es una de las especies mas amenazadas de la Familia Cracidae (Aves), considerada a nivel global por la UICN como "En Peligro". Esta especie es endémica de los bosques estacionalmente inundados por ríos de aguas blancas (denominados como "*várzea*") de la sección centro-oeste de la cuenca Amazónica. Su distribución se encuentra extremadamente fragmentada debido a la caza y destrucción del hábitat, con sub-poblaciones generalmente limitadas a menos que 250 individuos. En Brasil, donde se estima que existen las mayores poblaciones del Piurí, casi nada se conoce de su situación de conservación actual. Un diagnóstico etno-biológico previo realizado en la Reserva de Desarrollo Sostenible Piagaçu Purus (RDS-PP, en el Estado Amazonas Brasilero) mostró que las comunidades ribereñas consideran a esta especie (localmente llamada de "mutum-piuri") como relativamente común en el ambiente de *várzea* de la región. Esto motivó el inicio de un proyecto dirigido a investigar la ocurrencia y la abundancia de la especie en esta área protegida, mediante censos en trayectos lineales en ambiente de *várzea*, así como recorridos libres en áreas abiertas (orillas de lagos y ríos). El estudio tuvo lugar entre mayo y julio de 2013 en la época de aguas altas, en la sección norte de la RDS-PP, donde se encuentra la mayor porción del hábitat para la especie (aproximadamente el 80% de la *várzea* existente en esta unidad de conservación). Adicionalmente, la ocurrencia del Piurí fue estudiada mediante un muestreo piloto con cámaras-trampa colocadas en bosques de *várzea*, durante los siguientes meses de Septiembre a Diciembre, en la época de aguas bajas. Durante el período, fue realizado un esfuerzo de 223 km recorridos, encontrándose una abundancia relativa de 4,38 - 12,26 piurís/10 km, y una tasa de encuentro de entre 0,22 - 0,96 registros/km. El tamaño medio (± d.e.) de los grupos observados fue de 1,21±0,99 individuos, siendo la mitad (52,3%) grupos mixtos, y el resto, individuos solitarios. La gran mayoría de los individuos observados fueron adultos, aunque también fueron observados algunos sub-adultos del año anterior. Como resultado del foto-trampeo (2618 días*cámaras en 68 estaciones de muestreo) se obtuvo que la especie con la mayor tasa de captura fue el Piurí, con 44% de todos los registros (n= 176), y permitió conseguir informaciones complementarias acerca del patrón de actividad diaria, la organización social y uso del hábitat de la especie. Las abundancias encontradas en este estudio son similares a aquellas encontradas para otras regiones de la cuenca Amazónica (como Colombia y Perú) y entre las mayores reportadas para la especie hasta el momento. Esto sugiere la existencia de una población de *C. globulosa* potencialmente importante a nivel global en el bajo Río Purus, siendo necesario evaluar su situación más al sur de la cuenca de este río. Debido a los vacíos de información existentes, resulta prioritario seguir

estudiando las poblaciones de esta amenazada especie para tener un mejor entendimiento de su distribución y estado de conservación reales.

English

Preliminary data from the population status of Piuri or Pavon Wattled Curassow Crax globulosa in Sustainable Development Reserve Piagaçu-Purus (RDS-PP) % 2C low Alto Purús River% 2C Brazil.

The Piuri Crax globulosa is one of the most endangered species of the Family Cracidae (Birds) % 2C considered at the global level by the IUCN as "endangered". This species is endemic to the forests seasonally flooded by white water rivers (referred to as "várzea") section of the center-west of the Amazon basin. Its distribution is extremely fragmented due to hunting and habitat destruction% 2C with sub-populations generally limited to less than 250 individuals. In Brazil% 2C where it is estimated that there are the largest populations of Piuri% 2C almost nothing is known of its conservation status current. A diagnostic ethno-biological prior made in Sustainable Development Reserve Piagaçu Purus (RDS-PP% 2C in the Brazilian State of Amazonas) showed that coastal communities consider this species (locally called "Mutum-piuri") as relatively common in the varzea environment of the region. This led to the start of a project to investigate the occurrence and abundance of the species in this protected area% 2C through censuses in linear journeys in varzea environment% 2C as well as free tours in open areas (lakes and rivers). The study took place between May and July of 2013 at the time of high waters% 2C in the northern section of the RDS-PP% 2C where is the largest portion of the habitat for the species (approximately 80% of the várzea existing in this conservation unit). Additionally% 2C the occurrence of Piuri was studied using a pilot sampling with cameras-trap placed in forests of varzea% 2C during the following months from September to December% 2C at the time of low water. During the period% 2C was made an effort to 223 km% 2C being a relative abundance of 4 % 2C38 - 12 % 2C26 piuris% 2F10 km% 2C and a rate of encounter between 0 % 2C22 - 0 % 2C96 records% 2FKM seals. The average size (± s.d.) of the groups observed was 1 % 2C21± 0 % 2C99 individuals% 2C being the half (52 % 2C3 %) mixed groups% 2C and the rest% 2C solitary individuals. The vast majority of observed individuals were adults% 2C but were also observed some sub-adults of the previous year. As a result of the photo-trapping (2618 days * cameras in 68 sampling stations) it was found that the species with the highest rate of catch was the Piuri% 2C with 44% of all searches (n% 3D 176) % 2C and allowed to get additional information about the pattern of daily activity% 2C the social organization and use of the habitat of the species. The abundances found in this study are similar to those found for other regions of the Amazon basin (such as Colombia and Peru) and among the largest reported for this species so far. This suggests the existence of a population of C. globulosa potentially important on a global level in the lower Rio Purus% 2C still necessary to evaluate your situation further south of the basin of this river. Due to the existing information gaps% 2C it is a priority to continue studying populations of this endangered species to have a better understanding of their distribution and conservation status real.

2:1&3:3

Title: **MANEJO PARTICIPATIVO PARA LA CONSERVACIÓN DE LA TORTUGA CHARAPA (*Podocnemis unifilis*) EN EL PARQUE NACIONAL YASUNÍ, AMAZONÍA ECUATORIANA**

[PARTICIPATORY MANAGEMENT FOR THE CONSERVATION OF THE TURTLE (*Podocnemis unifilis*) IN THE YASUNI NATIONAL PARK, ECUADOR'S AMAZON]

Author(s): Rubén Cueva, Wilmer Grefa, Benito Coquinche & Esteban Suárez
Email:
Country: Ecuador

Abstract:

Entre las especies de fauna silvestre que habitan los ríos de la cuenca amazónica, las tortugas charapa (*Podocnemis* spp.) son muy importantes por su crucial rol ecológico como dispersores de semillas, limpiadores del sistema acuático, y como fuente de alimento para otras especies de fauna acuática. En la Amazonía ecuatoriana, las tortugas charapas están siendo fuertemente amenazadas por la sobreexplotación de sus huevos para el consumo local y para la comercialización en mercados locales. Desde 2008, Wildlife Conservation Society, Programa Ecuador, junto a cinco comunidades locales, ha implementado un programa de manejo participativo de tortugas charapas en la región noroccidental del Parque Nacional Yasuní. El objetivo del proyecto es mitigar la disminución de laspoblaciones de tortugas charapa y apoyar su recuperación a través de la colección dehuevos, eclosióny cría en cautiverio, y posterior liberación. Desde 2008, en cinco comunidades se sembraron un total de 14 667 huevos, de los cuales eclosionaron 9424 y 7606 tortugas fueron liberadas. Complementamos estas actividades con monitoreo poblacional de tortugas charapas en los ríos Napo y Tiputini, talleres de capacitación, reuniones comunitarias y transferencia de experiencias de manejo. En el Río Napo, la estimación de abundancia relativa de charapas en 2009, antes de la primera liberación, fue de 1,2 ind./km de muestreo. Luego de cuatro períodos de liberación, la abundancia relativa fue de 4,6 ind./km en el año 2013. En el Río Tiputini, en muestreos realizados entre 2008 y 2009, antes de las liberaciones, la abundancia relativa fue de 1,0 ind./km de río y luego de tres liberaciones la tasa fue de 3,4 ind./km en 2013. Esta experiencia de manejo ha sentado las bases para la continuación de este programa de manejo que pretende contribuir a la conservación a largo plazo de las tortugas de río en la región noroccidental del Parque Nacional Yasuní.

Among the species of wildlife that inhabit the rivers of the Amazon basin, the charapa turtles (*Podocnemis* spp.) are very important for their crucial ecological role as seed dispersers, cleaning of the water system, and as a source of food for other species of aquatic fauna. In the Ecuadorian Amazon, the charapa turtles are being strongly threatened by overexploitation of their eggs for local consumption and for sale in local markets. Since 2008, Wildlife Conservation Society, Ecuador program, along with five local communities, has implemented a programme of participatory management of the charapa turtles in the North-West region of Yasuni National Park. The project aims to mitigate the decrease in populations of charapa turtles and supporting their recovery through the

excluding collection, eclosiony breeds in captivity, and subsequent release. Since 2008, a total of 667 14 eggs, were planted in five communities of which hatched 9424 and 7606 turtles were released. We complement these activities with turtles population monitoring charapas rivers Napo, Tiputini, workshops for training, community meetings and transfer of experiences of management. In the Napo River, the estimation of relative abundance of charapas in 2009, prior to the first release, was 1.2 IND. / km from sampling. After four periods of release, the relative abundance was 4.6 IND. / km in the year 2013. In the Tiputini River, in samples taken between 2008 and 2009, before the releases, the relative abundance was 1.0 IND. / km of river and after three releases the rate was 3.4 IND. / km in 2013. This driving experience has laid the foundations for the continuation of this management program which aims to contribute to the long-term conservation of the river turtles in the North-West region of Yasuni National Park.

2:1&3:4

Title: **USO Y APROVECHAMIENTO DE LAS TORTUGAS CONTINENTALES DE COLOMBIA**
[USE AND EXPLOITATION OF THE CONTINENTAL TURTLES COLOMBIA]

Author(s): Carlos A. Lasso y Mónica A. Morales-Betancourt
Country: Columbia
Email: classo@humboldt.org.co
Country: Colombia

Abstract:

Spanish

El aprovechamiento de las tortugas acuáticas y terrestres comenzó con la llegada de los primeros grupos indígenas al continente hace más de 14 mil años. La literatura desde la época colonial documenta el uso de la carne y los huevos de quelonios por parte de los grupos indígenas. En la actualidad en las cuencas del Amazonas y Orinoco, el consumo de las tortugas ya no es exclusivo de los indígenas, sino que ha sido adoptado por los llamados colonos y campesinos, quienes consumen (o comercian) el recurso de manera complementaria, mientras que para los indígenas es la principal fuente proteica después del pescado. Por otra parte, en la zona norte del país el consumo de este grupo es generalizado, dándose no solo por las comunidades rurales, sino que en las grandes ciudades como Montería, Cartagena y Barranquilla entre otras, hay por tradición una alta demanda de carne de tortuga, la cual también ha aumentado debido al incremento demográfico. El uso de este grupo es diversificado y se utiliza además de como alimento, de forma ornamental, medicinal, tradicional, como mascotas y existe un tráfico ilegal considerable, que afecta a las poblaciones naturales. Sin embargo, a pesar de su gran e intenso consumo y la importancia que este representa para la seguridad alimentaria de muchas zonas rurales del país, no hay prácticamente información básica de esta actividad, tal que permita generar lineamientos de manejo. Frente a la falta de datos concretos sobre el uso de tortugas en Colombia, es común ver esfuerzos de estimarlo mediante entrevistas con personas locales sobre sus patrones de uso, pero esta información no siempre es de fácil acceso y además los usuarios son renuentes frecuentemente, a dar información confiable, especialmente porque temen que de acuerdo con esa información se tomen medidas restrictivas. La

cacería orientada específicamente a quelonios puede asociarse con una optimización direccionada de la misma, ya que se buscan aquellas especies de mejor rendimiento y con las cuales se disminuya el esfuerzo de captura y los costos de operación. También se relaciona con la abundancia y con la influencia cultural en la dieta local. Existe un efecto que se puede denominar de substitución, el cual está relacionado con el agotamiento local de las poblaciones de quelonios, particularmente las preferidas para su consumo y que son reemplazadas por otras menos apetecidas históricamente. Así, los usuarios comienzan a utilizar otras especies que deben tener como requisito mínimo: menor o igual esfuerzo de captura al que se tenía para la especie que empieza a declinar localmente y factores comerciales favorables que dependen de la oferta y la demanda, el cual se relaciona con preferencia de consumo, cultura e ingresos económicos locales. Para el Amazonas y la depresión Momposina la declinación poblacional e inclusive la extinción local de los quelonios preferidos como Podocnemis expansa y Podocnemis lewyana respectivamente, está ocasionando una reorientación de la captura y consumo hacia las demás especies de tortugas, inclusive para aquellas no preferidas anteriormente, como Peltocephalus dumerilianus y Kinosternon scorpiodes.

English

The use of aquatic and terrestrial turtles began with the arrival of the first indigenous groups to the continent more than 14,000 years ago. The literature from the colonial era documents the use of meat and eggs of turtles by indigenous groups. Today in the Amazon and Orinoco, the consumption of turtles is no longer exclusive to the Indians, but has been adopted by so-called settlers and farmers who consume (or trade) the use of complementary manner, while for indigenous is the main protein source after fish. Moreover, in the north of the country the consumption of this group is widespread, turning not only rural communities but in big cities like Monteria, Cartagena and Barranquilla among others, there is traditionally a high demand for meat turtle, which has also increased due to population increase. The use of this group is diversified and is also used as food for so ornamental, medicinal, traditional, as pets and there is considerable trafficking, which affects natural populations. However, despite its large and intense consumption and the importance it represents for food security in many rural areas of the country, there is practically no basic information of this activity, so that will generate management guidelines. Given the lack of specific data on the use of turtles in Colombia, it is common to see efforts to rectify it through interviews with local on your usage patterns people, but this information is not always easily accessible and also users are reluctant often to give reliable information, especially because they fear that information in accordance with restrictive action. Hunting turtles specifically geared to be associated with a directed optimizing it, since those species are sought and better performance with which the capture effort and decrease operating costs. It also relates to the wealth and cultural influence in the local diet. There is an effect that can be referred to substitution, which is related to the local depletion of turtles, particularly preferred for consumption and are replaced by less historically relished. Thus, users begin to use other species must have as a minimum requirement: less than or equal to the capture effort to be had for the species begins to decline locally and favorable commercial factors that depend on supply

and demand, which related to consumer preference, culture and local income. For Amazon and depression Momposina population decline and even local extinction of turtles preferred as expansa podocnemis and lewyana respectively podocnemis, is causing a shift in the capture and consumption towards other species of turtles, even for those not preferred above as Peltocephalus dumerilianus and Kinosternon scorpiodes.

2:1&3:5

Title: USO Y APROVECHAMIENTO DE LOS CROCODYLIA DE COLOMBIA

USE AND EXPLOITATION OF CROCODYLIA OF COLOMBIA

Authors: Monica A. Morales-Betancourt y Carlos A. Lasso
Email: mmorales@humboldt.org.co
Country: Colombia

Abstract:

Spanish

En Colombia la fauna es una fuente importante de proteína para las comunidades rurales, las cuales representan el 27% de la población total del país. Los crocodílidos forman parte de este renglón y además de la extracción de la piel, este grupo es aprovechado tradicionalmente con distintos fines como el consumo, ornamental, medicinal y mascotas. Recientemente se ha reportado otro tipo de uso, como es el caso de las babillas (*Caiman crocodilus*) en la Orinoquia y el caimán negro (*Melanosuchus niger*) en la Amazonia, donde la carne de estas especies se utiliza como carnada para capturar la mota (*Calophysus macropterus*), un pez carroñero. En el Trapecio Amazónico, se utiliza la carne de la cola del caimán negro, la cual es vendida de forma fresca o refrigerada como carne de bagre (Pseudoplatystoma spp) o seca-salada como pirarucú (Arapaima gigas). En cuanto al consumo de los crocodílidos como alimento hay ciertas restricciones en relación al tamaño de los animales, teniendo mayor preferencia por los individuos más pequeños, dado que su carne es más tierna y de mejor sabor. Así, en las especies de menor tamaño como los cachirres (Paleosuchus palpebrosus y Paleosuchus trigonatus) y la babilla (Caiman crocodilus), su uso está dirigido principalmente para el consumo. Por otra parte, aún existen algunas restricciones por creencias culturales, como es el caso del caimán negro, y en algunas de las comunidades ubicadas en el bajo río Putumayo y en el río Caquetá (Amazonas) no son objeto de consumo ya que son animales sagrados. A pesar del consumo elevado y la importancia que este representa para la seguridad alimentaria de muchas zonas rurales del país, no hay prácticamente información sobre esta actividad, tal que permita generar lineamientos de manejo. Por ejemplo, no se conoce cuanto es la ingesta o el aporte nutricional de estos animales en la dieta de las comunidades o el aporte en la economía local. Igualmente no hay información cuantitativa sobre los niveles de cosecha y los efectos de esta actividad sobre las poblaciones naturales. Un punto importante en la conservación de los crocodílidos debe ser el conocimiento de los patrones de uso, el efecto de este sobre las poblaciones naturales y su importancia para la subsistencia comunitaria. Además de los vacíos de información en cuanto al consumo, la investigación sobre la historia natural de las especies objeto de esta actividad, también es incipiente. Es preocupante, por ejemplo, saber que especies como los cachirres no cuentan con un solo estudio a nivel

nacional en el medio natural. La investigación sobre el aprovechamiento y la historia natural de las especies constituyen la única metodología robusta y verificable, para poder establecer las tendencias demográficas de las poblaciones en respuesta a todos los efectos antrópicos. Esto es la base fundamental para dar paso hacia un uso sostenible.

English

In Colombia wildlife is an important source of protein for rural communities, which represent 27% of the total population. The crocodilians are part of this line and also the removal of the skin, this group is traditionally exploited for various purposes such as consumption, ornamental, medicinal and pets. Recently it has been reported other use, such as the alligators (*Caiman crocodilus*) in the Orinoco and the black caiman (*Melanosuchus niger*) in the Amazon, where the meat of these species is used as bait to capture Speck (*Calophysus macropterus*), a scavenger fish. In the Amazon rain forest, beef and black alligator tail is used, which is sold fresh or chilled form as meat catfish (Pseudoplatystoma spp) or dry-salted as arapaima (Arapaima gigas). On the consumption of food crocodilians as there are certain restrictions on the size of the animals, with greater preference for smaller individuals, since their meat is more tender and better tasting. Thus, in the smaller species such as cachirres (Paleosuchus palpebrosus and Paleosuchus trigonatus) and stifle (Caiman crocodilus), its use is primarily intended for consumption. Moreover, there are still some restrictions on cultural beliefs, such as the black caiman, and in some communities in the lower Rio Putumayo and Caquetá in (Amazonas) River are not subject to consumption since they are sacred animals . Despite the high consumption and the importance it represents for food security in many rural areas of the country, there is virtually no information on this activity, so that will generate management guidelines. For example, it is unknown as is the intake or the nutritional value of these animals in the diet of communities or contribution to the local economy. Equally there is no quantitative information on harvest levels and the effects of this activity on wild populations. An important point in the conservation of crocodilians must be knowledge of use patterns, the effect of this on natural populations and their importance to community livelihoods. In addition to the information gaps in consumption, research on the natural history of the species involved in this activity, is also emerging. Worryingly, for example, know that species like cachirres not have a single national study in the wild. Research on the Development and natural history of the species are the only robust and verifiable methodology to establish population trends of populations in response to all anthropogenic effects. This is essential to give way to a sustainable use basis.

2:1&3:6

Title: **THE MOUNTAIN CHICKEN OF DOMINICA [*Leptodactylus fallax*]**

Author(s): Prevost, C. and Garcia, G.W.

Country: Dominica

2. Management for the conservation of **Mammalian species**

3. Management for the conservation of **Reptiles and Amphibians**

Title: **SISTEMA DE MANEJO PARTICIPATIVO DOS JACARÉS AMAZÔNICOS NAS RESERVAS DE DESENVOLVIMENTO SUSTENTÁVEL MAMIRAUÁ E AMANÃ, AMAZÔNIA BRASILEIRA [A SYSTEM OF PARTICIPATORY MANAGEMENT OF AMAZONIAN ALLIGATORS WITHIN SUSTAINABLE DEVELOPMENT RESERVES MAMIRAUÁ AND AMANA, BRAZILIAN AMAZON]**

Authors: Robinson Botero-Arias e Kelly Torralvo
Email: robin@mamiraua.org.br
Country: Brazil

Abstract:

Portuguese

O histórico recente de exploração das espécies de jacarés amazônicos teve início na década de 1950 e perdurou até o final da década de 1970. Neste período, a caça indiscriminada levou a diminuições drásticas das populações naturais de jacarés amazônicos. Depois da proibição do aproveitamento econômico da fauna silvestre no Brasil, em 1967, foi documentado o incremento de muitas populações selvagens de jacarés na Amazônia brasileira. No entanto, o comércio ilegal de carne se transformou em uma alternativa de uso destes animais para muitas populações ribeirinhas, perdurando até os dias atuais. Em 2004, o governo do Estado do Amazonas iniciou a implementação do primeiro projeto de manejo experimental de jacarés na Amazônia brasileira, na Reserva de Desenvolvimento Sustentável Mamirauá. Esta proposta foi desenvolvida de forma experimental e incluiu atividades de extração de jacarés, associadas a modelos de manejo sustentável dos recursos naturais já desenvolvidos pelos moradores da reserva. Desde 2008, o Programa de Pesquisa em Conservação e Manejo de Jacarés do Instituto Mamirauá intensificou os estudos para o desenvolvimento de critérios técnicos e científicos que subsidiem um sistema de manejo sustentável de jacarés amazônicos com base comunitária. Estes critérios baseiam-se principalmente na identificação de áreas de nidificação e de áreas potenciais para extração, assim como critérios excludentes associados ao tamanho e sexo dos jacarés a serem manejados. Parte destes critérios foi inserida na legislação estadual que, desde 2011, normatiza o manejo de jacarés no Estado de Amazonas. Com o intuito de viabilizar e colocar em prática as diretrizes legais para o manejo de jacarés amazônicos tem-se estruturado um sistema de manejo participativo. Na construção e estabelecimento das bases deste tenta-se garantir a participação das comunidades, a sua inserção nos esquemas produtivos locais e nas ações de acompanhamento técnico e científico do processo. As primeiras ações estiveram associadas ao mapeamento participativo dos recursos, de forma que comunidades reconhecessem as potencialidades e fragilidades de seu entorno. Nos

mapas foram identificadas as áreas de preservação, manutenção e comercialização de peixes, que já compõem parte das atividades de manejo de algumas comunidades. Foram mapeados 694 corpos hídricos, associados a 37 comunidades das Reservas Mamirauá e Amanã, sendo registrada a presença de jacaré-açu e jacaretinga em 77,81% e 61,53% destes, respectivamente. A ocorrência de ninhos de jacarés-açu foi registrada em 51,30% dos corpos hídricos mapeados e em 36,74%, foi registrada a ocorrência de ninhos de jacaretinga. Dos corpos de água mapeados, foram visitados 92 (13,26%), para verificar as informações dos mapeamentos, sendo registrados ninhos de jacaré-açu em 57 corpos de água e ninhos de jacaretinga em 23. Estas informações estão subsidiando atividades de monitoramento de ninhos, levantamento populacional das espécies e viabilizando estratégias de organização comunitária em prol de um futuro aproveitamento comunitário de jacarés. Além disso, baseado nas informações levantadas e com o intuito de apresentar critérios e orientações para definir as primeiras fases da estruturação de um sistema participativo de manejo Jacarés, o Instituto Mamirauá publicou em 2013 o Protocolo: Construindo as Bases para um Sistema de Manejo Participativo dos Jacarés Amazônicos.

English

The recent history of exploitation of the Amazonian species of alligators began in 1950 and lasted until the late 1970s. During this period, over-hunting led to dramatic declines in natural populations of Amazonian caimans. After the prohibition of economic use of wildlife in Brazil, in 1967, the increase has been documented in many wild populations of alligators in the Brazilian Amazon. However, the illegal trade of meat turned into an alternative use of these animals for many riverside populations, lasting to the present day. In 2004, the government of Amazonas state began implementing the first experimental project management of alligators in the Brazilian Amazon, in the Sustainable Development Mamirauá. This proposal was developed experimentally and included extraction Gators activities associated with models of sustainable management of natural resources already developed by the residents of the reservation. Since 2008, the Research Program on Conservation and Management of Alligators Mamirauá Institute intensified studies for the development of technical and scientific criteria that support a system of sustainable management of Amazonian Gators community based. These criteria are mainly based on the identification of nesting areas and potential areas for extraction, as well as exclusionary criteria associated with the size and sex of alligators to be managed. Of these criteria was included in state law that since 2011, regulates the management of alligators in the state of Amazonas. Aiming to facilitate and implement the laws for the management of Amazonian Gators guidelines has been structured a system of participatory management. Construction and establishment of the bases of this we try to ensure the participation of communities, their inclusion in local productive schemes and actions of technical and scientific monitoring of the process. The first actions were associated with participatory resource mapping, so that communities recognize the strengths and weaknesses of your surroundings. Maps in the areas of preservation, maintenance and marketing of fish, which already make up part of the management activities of some communities were identified. 694 water bodies associated with 37 communities

Reservations Mamirauá and Amana were mapped and recorded the presence of black caiman caimans and in 77.81% and 61.53% of them, respectively. The occurrence of nests of alligators was recorded in 51.30% of the mapped water bodies and 36.74%, was recorded the occurrence of nests of caimans. Mapped bodies of water, were visited 92 (13.26%), to verify the information mappings, being recorded nests of black caiman in 57 water bodies and nests jacaretinga 23. These are subsidizing monitoring activities nests, population survey of species and enabling strategies for community organization towards a future Community use of alligators. Furthermore, based on the information gathered and in order to present criteria and guidelines for defining the early stages of designing a participatory management system Alligators, the Institute published in 2013 Mamirauá Protocol: Building the Foundations for a System of Participatory Management of alligators Amazon.

Title: MANEJO PARTICIPATIVO PARA LA CONSERVACIÓN DE LA TORTUGA CHARAPA (PODOCNEMIS UNIFILIS) EN EL PARQUE NACIONAL YASUNÍ, AMAZONÍA ECUATORIANA [PARTICIPATORY CONSERVATION MANAGEMENT OF CHARAPA TURTLE (*P. unifilis*) IN THE YASUNI NATIONAL PARK, ECUADORIAN AMAZON]

Authors: Rubén Cueva1, Wilmer Grefa2, Benito Coquinche3 & Esteban Suárez4.
Email: rcueva@wcs.org
Country: Equador

Abstract:
Spanish

Entre las especies de fauna silvestre que habitan los ríos de la cuenca amazónica, las tortugas charapa (Podocnemis spp.) son muy importantes por su crucial rol ecológico como dispersores de semillas, limpiadores del sistema acuático, y como fuente de alimento para otras especies de fauna acuática. En la Amazonía ecuatoriana, las tortugas charapas están siendo fuertemente amenazadas por la sobreexplotación de sus huevos para el consumo local y para la comercialización en mercados locales. Desde 2008, Wildlife Conservation Society, Programa Ecuador, junto a cinco comunidades locales, ha implementado un programa de manejo participativo de tortugas charapas en la región noroccidental del Parque Nacional Yasuní. El objetivo del proyecto es mitigar la disminución de las poblaciones de tortugas charapa y apoyar su recuperación a través de la colección de huevos, eclosión y cría en cautiverio, y posterior liberación. Desde 2008, en cinco comunidades se sembraron un total de 14 667 huevos, de los cuales eclosionaron 9424 y 7606 tortugas fueron liberadas. Complementamos estas actividades con monitoreo poblacional de tortugas charapas en los ríos Napo y Tiputini, talleres de capacitación, reuniones comunitarias y transferencia de experiencias de manejo. En el Río Napo, la estimación de abundancia relativa de charapas en 2009, antes de la primera liberación, fue de 1,2 ind./km de muestreo. Luego de cuatro períodos de liberación, la abundancia relativa fue de 4,6 ind./km en el año 2013. En el Río Tiputini, en muestreos realizados entre 2008 y 2009, antes de las liberaciones, la abundancia relativa fue de 1,0 ind./km de río y luego de tres liberaciones la tasa fue de 3,4 ind./km en 2013. Esta

experiencia de manejo ha sentado las bases para la continuación de este programa de manejo que pretende contribuir a la conservación a largo plazo de las tortugas de río en la región noroccidental del Parque Nacional Yasuní.

Among the wildlife species that inhabit the rivers of the Amazon basin, the charapa turtles (*Podocnemis* spp.) Are very important for their crucial ecological role as seed dispersers , cleaners aquatic system , and as a food source for other species aquatic fauna. In the Ecuadorian Amazon , the turtles turtles are being heavily threatened by overexploitation of eggs for local consumption and marketing in local markets. Since 2008 , Wildlife Conservation Society, Ecuador Program , along with five local communities, has implemented a program of participatory management charapas turtle in the northwestern region of the Yasuni National Park. The project objective is to mitigate the decline in turtle populations charapa and support their recovery through the collection of eggs, hatching and rearing in captivity and subsequent release . Since 2008, five communities totaling 14,667 eggs, which hatched 9424 and 7606 were released turtles were planted . We complement these activities with charapas turtle population monitoring in rivers Napo and Tiputini , workshops, community gatherings and transfer of management experiences . In the Napo River, the estimated relative abundance of charapas in 2009 , before the first release was 1.2 ind. / Km sampling . After four periods of release , the relative abundance of 4.6 ind. / Km in 2013 . Tiputini In Rio , in surveys conducted between 2008 and 2009 , before the release , the relative abundance was 1.0 ind. / km of river and after three releases the rate was 3.4 ind. / km in 2013. this driving experience has laid the foundation for the continuation of this management program that aims to contribute to long-term conservation turtles river in the northwestern region of the Yasuni National Park.

4. Management for the conservation of **Invertebrates and Stingless Bees**

2:4:1
Title: **ECOLOGICAL IMPORTANCE OF SPIDERS**
Author(s): Jo-Anne Nina Sewlal
Email: **joannesewlal@gmail.com or Jo-Anne.Sewlal@sta.uwi.edu**
Country: T&T
Abstract:

Spiders form one of the most speciose animal orders, and they are abundant top predators of invertebrates suggesting that they are important to ecosystem stability. On a global scale information on spider taxa is lacking especially in tropical regions, generally noted for high species richness and diversity. The rapid rate of habitat loss has made work in these regions vital for the conservation of global biodiversity. Unfortunately the ecological importance of spiders is overshadowed by popular culture like Halloween and science fiction: arachnophobia.
A literature review for a PhD project on the contribution of habitat diversity to the biodiversity of the spider families Araneidae, Nephilidae

and Tetragnathidae in Trinidad, West Indies, has showed that the ecological roles of spiders fall into three main categories; models for biological diversity study, indicator species, and biological control agents. Their abundance in almost every terrestrial ecosystem, sensitivity to habitat changes particularly with respect to vegetation structure, regulation of insect prey populations, and occupation of mid-trophic levels leads to these arthropods being almost perfect biodiversity candidates. Their predatory nature and occupation of many habitats favor the use of spiders as biological control agents. However, their frequent changing of web sites and abundance influenced by prey abundance and disturbance are disadvantages. Again their predatory nature coupled with a sensitivity to prey availability make them ideal as indicator species.

2:4:2

Title: **MANAGING BEES FOR CONSERVATION: THE *BERBICE SCENARIO***

Author(s): Jewel Liddell
Email:
Country: Guyana

Abstract:

Management for conservation of bees is often not an option for individuals and households who perceive bees as being harmful. The role of bees in pollination, honey production and subsequent agricultural productivity is often overlooked. However, a number of individuals in Berbice are involved in the management of bees for conservation. The study adopts a mixed methods approach comprising a desk review of key documents, field observations, questionnaire survey and key informants interviews with the aim to examine the issues and challenges of bee management for conservation in Berbice. In particular, this paper will (i)examine residents knowledge of the roles, importance and conservation of bees (ii) examine and evaluate how bees are managed in Berbice (iii) identify issues and challenges related to bee management and (iv) suggest interventions to improve the capacity bee managers to improve the management of this resource.

2:4:3

Title: **THE STATUS OF STINGLESS BEE PRODUCTION IN TRINIDAD AND TOBAGO**

Author(s): Louis Farrell, Gladstone Solomon, Christopher Starr and Gary Garcia
Country: T&T

2:4:4

Title: **SYSTEMS OF PRODUCTION OF STINGLESS BEES**

Author(s): Louis Farrell, Gladstone Solomon, Christopher Starr and Gary Garcia
Country: T&T

5. Inland fisheries management /**Inland Aquatic species**

2:5:1

Title: **RISE AND MANAGEMENT OF AN UNSUSTAINABLE FISHERY FOR *Calophysus macropterus* IN THE AMAZON**

Author(s): Sannie M. Brum; Felipe Rossoni; Vera M. F. da Silva; Leandro Castello

Email: **sanniebrum@gmail.com**

Country: Brazil

Abstract:

Previous studies identified a rapidly developing fishery in the Amazon Basin for piracatinga (Calophysus macropterus), which can cause adverse food-web impacts via the use dolphin and caiman species as bait. Lack of studies on the piracatinga fishery limits current capacity to understand necessary management action. Via interviews with fishers and analysis of records, this study investigated in Brazil the piracatinga fishers, harvest methods, types of baits used, commercialization chains, and overall production levels. It was found that piracatinga fishers are subsistence fishers who harvest piracatinga as a means to alleviate economic constraints caused by closed seasons and decreases seasonal availability of fish during high water levels. Harvesting is done via the use of wooden and nylon crates and cages in which dead caimans and dolphins are placed to attract piracatinga until the door of the crates or cages are closed to trap them. Caimans are the main bait reported (96% of interviewees). Botos (Inia geoffrensis) are less used (89% of interviewees) but this fishery has been addressed as the main current threat for its populations due its low reproductive rate, with alarming mortality estimates. Piracatinga are sold to intermediate sellers who distribute it for export to Colombia and, recently, Manaus and other Brazilian cities markets. This fishery is rapidly expanding at an estimated mean annual rate of 55% and may soon become of the Amazon´s largest. Because dolphins and caimans are the principal bait, and both taxa groups are already endangered, there is an urgent need to identify and implement effective management strategies to impede this use for the piracatinga fishery. There are three management options. Option 1: no change. This essentially means to continue the current management structure based on restrictions of the use of caiman and dolphins as bait. Option 2: to propose improved enforcement of regulations protecting dolphins and caimans. This is unlikely to produce any effect, given the difficulties of enforcing subsistence fisheries. Option 3: to ban the piracatinga fishery. Although enforcement of fisheries regulations is expected to always be deficient in the Amazon unless major policy and institutional changes occur, banning the harvest of piracatinga could be enforced more effectively than in option two via enforcement of the commercialization process.

2:5:2
Title: **PIRARUCU (*Arapaima spp., teleostei, osteoglossidae*) POPULATION DENSITIES IN FLOODPLAIN REGIONS OF SUSTAINABLE DEVELOPMENT RESERVE OF PIAGAÇU PURUS**
Author(s): Thiago A. Petersen; Sannie M. Brum; Luciana S. Melo; Felipe Rossoni
Country: Brazil

2:5:3
Title: **"PEIXES DA FLORESTA": A PARTICIPATORY MANAGEMENT PROJECT IN BRAZILIAN AMAZON**
"FISH OF THE FOREST": A THE PARTICIPATORY MANAGEMENT PROJECT IN BRAZILIAN AMAZON
Author(s): Felipe Rossoni, Sannie Brum, Gabriel Cardoso, Thiago Petersen, Luciana Melo, Felipe Carvalho, Gabriela Fink, Boris Marioni, Camila Freitas, Eduardo von Mühlen, Heloisa Brum, Eduardo Venticinque
Email: **feliperossoni@gmail.com**
Country: Brazil
Abstract:
In Amazonia, fish is a major source of animal protein for local people, with fishing one of the most important commercial activities. The intensive pressure on fish stocks is resulting in the overexploitation of many commercially important species. The lower Purus River is one of the principal sources of fish for large urban centres, including the capital of Amazonas, Manaus, and Manacapuru. Since 2004 the Instituto Piagaçu (IPi) has been working together with local communities in Piagaçu-Purus Sustainable Development Reserve (RDS-PP) with research initiatives designed to implement participatory management of fishery resources. This study aims to review advances and perspectives of these experiences. The reserve covers approximately 870 thousands hectares and was divided into sectors, resulting in seven management units encompassing close to 55 communities/localities. Four of these sectors (approximately 21 communities) have delimited their areain the designation of priority areas for both strict protection and managed use, each with their respective rules regarding any activities that exploit the natural resources. Through regional meetings these rules are collectively discussed and approved by local people and researchers, and this is the first step in implementing management activities. Between 2008 and 2013 standardized counts of pirarucu (Arapaima spp.) demonstrated an increase of more than 900% in the number of individuals in areas effectively managed in three sectors. Since 2010 fishing quotas for individual adults (above 1.5 m) authorized by Instituto Brasileiro de Meio Ambiente e Recursos Naturais Renováveis (IBAMA) are resulting in the generation of income for seven communities directly involved in the initiative. Another important resource, the tambaqui (Colossoma macropomum) was also being exploited at unsustainable levels. In 2007, a survey across the reserve verified an average length under the minimum permitted (55cm). In 2009, individuals of tambaqui were present in only 20% of the lakes surveyed in managed areas. By 2013, the communities situated in flooded forest (varzea) have performed collective fisheries of this species, with an average length of 60.5 cm, above the minimum size permitted, and a production increase of 1200%. An experience of ornamental fishes exploitation is being implemented with mortality ratio passing close to 30-40% to 0.8% and the

value of individuals has increased approximately 5000%. The results of the last two years show the effective results of the participatory process, with strategies discussed and adapted with the local communities (co-management). Further research activities are now being identified, principally with courses for fishermen, formation of leaders and environmental education for children and adults. Following these encouraging results, communities in other sectors are now presenting mandates in order to expand the management areas. This project is sponsored by Petrobras, Petrobras Environmental Program and the Instituto de Desenvolvimento Sustentável Mamirauá (IDSM), supported by the Centro Estadual de Unidades de Conservação (CEUC).

2:5:4

Title: **A MORTALIDADE DE JACARÉS E BOTOS ASSOCIADA COM A PESCA DA PIRACATINGA NA REGIÃO DO MÉDIO SOLIMÕES-AMAZONAS, BRASIL**
[THE MORTALITY OF ALLIGATORS AND DOLPHINS ASSOCIATED WITH FISHING FOR CATFISH IN THE MIDDLE SOLIMÕES-AMAZONAS, BRAZILL]

Authors: Robinson Botero-Arias, Diogo de Lima e Miriam Marmontel
Email: robin@mamiraua.org.br
Country: Brazil

Abstract:

Portuguese

A pesca da piracatinga tem-se caracterizado como uma atividade predatória, associada ao uso de jacarés e botos, como isca. A piracatinga (Calophysus macropterus) é um peixe liso, de aproximadamente 50 centímetros de comprimento, de baixo interesse comercial no passado, e pouco apreciado pelos moradores do Médio Solimões. Recentemente, associado a um princípio de oferta e procura, a piracatinga tem experimentado uma demanda crescente pelo comércio pesqueiro colombiano e, aparentemente, também por outros mercados brasileiros. No médio rio Solimões, nas proximidades das reservas de desenvolvimento sustentável Mamirauá e Amanã – Brasil, os primeiros registros da pesca da piracatinga usando jacarés, como isca, aconteceu no final dos anos 90. Passando de atividade esporádica e efetuada de forma improvisada, hoje em dia a pesca da piracatinga está sustentada em uma cadeia produtiva simples, mas bem estruturada, fundamentada basicamente em uma expectativa de alto lucro de forma rápida. A pesca e comercialização da piracatinga tem uma sazonalidade determinada pelas demandas comerciais e a entressafra de outros peixes de maior interesse comercial, sendo que o preço de venda ao comprador intermediário varia ao longo do ano, de U$ 0,23 até U$ 0,70 por quilograma de animal eviscerado, sendo mais bem paga no inicio da vazante (Julho) e no repiquente (Novembro). Os preços de compra da piracatinga geralmente são preestabelecidos por tabelas de preços, que os barcos pesqueiros usam como referência no momento da comercialização. Em muitos casos, pescadores que moram perto dos centros urbanos transportam sua produção de piracatinga para os flutuantes pesqueiros e frigoríficos, realizando as transações diretas e melhorando o valor de venda, o qual varia de U$0,36 a U$0,95, segundo a época. A intensidade e a forma de pescar não são homogêneas entre as comunidades que pescam a piracatinga, nem o esforço ao longo do ano,

podendo em algumas comunidades variar de eventos ocasionais a até 150 ocorrências de pesca por ano. A obtenção e tratamento das iscas para pescar piracatinga é uma atividade que envolve em muitos casos os próprios pescadores, sendo que esta atividade demanda a captura e abate dos animais com um ou dois dias de antecedência. Além dos pescadores que caçam suas próprias iscas, existem também caçadores especializados em fornecer jacarés e botos para pescadores, o que demonstra que começa a haver uma clara especialização dentro desta cadeia produtiva, ainda que incipiente. São praticadas tabelas de preço que variam de U$4,5 para jacarés de 1,5 m a até U$90,2 para jacarés de 4 m. Os preços dos botos-vermelhos variam de U$45,1 a U$135.35 por animal. Desde a visão de muitos pesquisadores e conservacionistas, a pesca da piracatinga é uma ameaça para as populações naturais de botos e jacarés, no entanto não existem estudos sistemáticos que reforcem esta afirmação. O Mistério Publico do Brasil decretou uma moratória para a comercialização da piracatinga, com o intuito de desestimular a caça de botos e jacarés para serem usados como iscas da piracatinga; esta ação entrará em vigência no 2015, mas não existe certeza das implicações e efeitos desta proibição.

English

Fishing for catfish has been characterized as a predatory activity, associated with the use of alligators and dolphins as bait. The catfish (Calophysus macropterus) is a flat fish, about 50 inches long, low commercial interest in the past, and little appreciated by the residents of the Middle Solimões. Recently, associated with a principle of supply and demand, the catfish has experienced a growing demand for Colombian fish trade and apparently also by other Brazilian markets. In the middle Solimões River, in the vicinity of sustainable development reserves Mamirauá and Amana - Brazil, the earliest records of fishing for catfish using alligators as bait, happened in the late 90 Passing of sporadic activity and performed an improvised way, today. day of fishing for catfish is supported in a single chain, but well structured, basically in an expectation of high profit quickly. Fishing and marketing of catfish has a seasonality determined by commercial demands and the offseason other fish greater commercial interest, and the selling price to the intermediate buyer varies throughout the year, U $ 0.23 to U $ 0, 70 per kg gutted animal, being highest paid at the beginning of the ebb tide (July) and repiquente (November). Purchase prices of catfish are usually predetermined by tariffs, which the fishing boats use as a reference at the time of marketing. In many cases, fishermen living near urban centers carry its production of catfish for fishing and floating refrigerators, conducting direct transactions and improving the sales value, which range from $ 0.36 to U.S. $ 0.95, according to time. The intensity and shape of fish are not homogenous among the catfish fishing communities nor the effort throughout the year, in some communities may vary from occasional occurrences of up to 150 fishing events per year. Obtaining and processing of catfish baits for fishing is an activity that involves in many cases the fishermen themselves, and that this activity requires the capture and killing of animals with one or two days in advance. In addition to the fishermen who hunt their own lures, there are also specialized in providing hunters alligators and dolphins for fishermen, which shows that there begins to be a clear specialization within this chain, still incipient. Price tables ranging from $ 4.5 to 1.5 ma Gators to U $ 90.2 m to 4 Gators are

practiced. Prices vary porpoises red-U to U $ 45.1 $ 135.35 per pet. From the view of many researchers and conservationists, fishing for catfish is a threat to the natural populations of dolphins and alligators, however there are no systematic studies that reinforce this statement. The Mystery of Public Brazil enacted a moratorium on the sale of catfish, in order to discourage the hunting of dolphins and alligators for use as catfish baits; this action will come into effect in 2015, but there is no certainty of the implications and effects of this ban.

6. Tools and innovative methodologies for the management of the wildlife/**Tools and Methodologies**

2:6:1

Title: **BEHAVIOURAL PROFILE STUDIES: ARE THEY A USEFUL TOOL TO IMPROVE AND FACILITATE WILDLIFE MANAGEMENT? 2 EXAMPLES WITH VERY DIFFERENT SPECIES: *HUMBOLDT PENGUIN* AND *GUANACO***

AUTHOR(S): JESSICA GIMPEL, LORENA SANCHEZ, JUAN PABLO RIVERA
Email: jessica.gimpel@gmail.com
Country: Chile

Abstract:
Wildlife management, either for conservation or productive purposes, is a very challenging area, precisely because it involves dealing with wild animals generally not used to human-animal interaction. Understanding species-specific behaviour is the first step towards designing sound management plans that involve some human proximity, ranging from captive-breeding reintroduction programmes to wildlife farming. However, we now know that this is not enough, because there is clear evidence that within a species, individuals have different personality traits which we can learn to recognise by distinguishing their behavioural profiles. In this paper we present examples from two separate studies conducted using the same methodology, in order to explore if this could be a useful tool to discriminate distinct personality traits in different species. We applied three behavioural tests to a group of captive Humboldt penguins (*Spheniscus humboldti*, n=16) and a group of captive guanacos (*Lama guanicoe*, n=15). The tests were basically a novel object test, surprise effect test and an agonist (penguins) or predator (guanacos) test in which they obtained a score according to their respose. They were adapted for species-specific behaviour and, in the case of guanacos, they were also complemented by a keeper questionnaire in order to look for potential correlations between perceived personalities and response to behavioural tests. This has shown to be a good predictor in several species, thus validating these questionnaires and avoiding the need to conduct behavioural tests with all animals. In both species it was possible to discriminate different personality traits. Both species showed two clear axis: Bold-Shy and Active-Passive. In penguins, only the novel object test was useful to fully differentiate animals. In the case of guanacos, the three tests were informative. Besides, in their case, 9 out of 25 traits present in the keeper questionnaire where highly correlated with responses to behavioural tests ($r>0.7$; $p<0.05$). We conclude that this is indeed a useful

methodology in both of these very diverse species. Its use can help to differentiate behavioural profiles within groups of animals, which is an important variable to predict how they might respond to management practices. Furthermore, it has been shown that an important part of reintroduction programmes' success relies on the preservation of behavioural diversity; thus making it essential to have the ability to distinguish behavioural styles among individuals that are candidates for reintroduction within a group

2:6:2

Title: **USO DE LOS MODELOS DE OCUPACIÓN PARA EL MONITOREO DE MAMÍFEROS EN ÁREAS SILVESTRES PROTEGIDAS**
[USE OF MODELS OF OCCUPANCY FOR MONITORING IN WILD MAMMALS OF PROTECTED AREAS]

Author(s): Sáenz Joel C. y Manuel Spínola
Email: jsaenz@una.cr
Country: Costa Rica

Abstract:
Spanish

La estimación de parámetros de una población de fauna silvestre resulta ser mucho más complicada que lo que se cree, debido a la complejidad e incertidumbre de las estimaciones. Dentro de este contexto, el monitoreo de poblaciones silvestres dentro y fuera de áreas protegidas necesitan de métodos sencillos y robustos que permitan estimaciones confiables para su seguimiento a largo plazo. Una de las maneras tradicionales para obtener una medida (ej. densidad y tamaño poblacional) de una población sujeta a monitoreo, es el conteo directo o indirecto de individuos, que puede producir estimados robustos o estimados sesgados como los índices de abundancia en cualquiera de sus expresiones. Este conteo requiere de un protocolo de muestreo riguroso para el levantamiento de la información, a pesar de ello, el análisis falla por la poca cantidad de datos que generalmente se obtienen, por lo tanto, los resultados son poco útiles para ser usados. Una alternativa a este problema es el uso de modelos de ocupación, que parten del supuesto que las especies silvestres son difícil de observar y, ocurre que algunas de ellas no son detectadas cuando en realidad están presentes. Estos modelos, estiman tanto, la probabilidad de ocupación (□) y la probabilidad de detección (p) a partir de múltiples muestreos repeticiones sobre transectos, donde la detección se representa con “1” y la no detección con “0”. Estos los modelos se han sido implementados actualmente para determinar la distribución, probabilidad de ocupación y detección de varias especies tropicales con bastante eficiencia mediante la incorporación de la probabilidad de detección en las estimaciones incluidas en los modelos, lo que reduce sesgos y proporciona inferencias solidas en la mayoría de los estudios. Usando esta aproximación se evaluó la tasa de ocupación de carnívoros en el Corredor Biológico San Juan - La Selva (CBSJLS), Costa Rica, usando trampas-cámara en 38 sitios y, ajustaron modelos de ocupación para cada especie. Se detectaron nueve especies de carnívoros cuya ocupación varió de 0.06 para el margay (*Leopardus wiedii*) y 0.68 para el tolomuco (*Eira barbara*), siendo el pizote (*Nasua narica*), tolomuco y ocelote (*Leopardus pardalis*) las especies con una ocupación superior a 0.5. Varios de los modelos tuvieron errores estándar muy elevados, probablemente por la baja detectabilidad de las especies. Dada la variedad de especies de carnívoros registrada y

detección del puma (*Puma concolor*) en cuatro de los sitios, se puede sugerir que el CBSJLS tiene un alto potencial para mantener poblaciones viables de mamíferos en general. Es importante promover el uso de estos modelos, como una alternativa para el monitoreo de especies en la áreas silvestres protegidas, debido a su relativo bajo costo, fácil implementación, robustez, análisis de los datos simplificados.

English

Parameter estimation of a population of wildlife is far more complicated than what is believed, due to the complexity and uncertainty of the estimates. Within this context, monitoring of wild populations within and outside protected areas need simple and robust methods allowing reliable estimates for long-term monitoring . One of the traditional ways to obtain a measure (eg population density and size) of a population subject to monitoring, is the direct or indirect counting of individuals , which can produce robust estimates or biased estimates as indices of abundance in any expressions. This count requires a rigorous sampling protocol for the collection of information, despite this , the analysis fails for the small amount of data that are generally obtained , therefore , the results are not very useful for use . An alternative to this problem is the use of occupancy models, which are based on the assumption that wildlife species are difficult to observe , and it happens that some of them are not detected when they are actually present. These models estimate both the probability of occupancy (□) and detection probability (p) from multiple repetitions of sampling transects , where detection is represented by "1" and the non-detection with "0" . These models have now been implemented to determine the distribution, occupancy and detection probability of several tropical species rather efficiently by incorporating the probability of detection in the estimates included in the models , which reduces bias and provides solid inferences most studies . Using this approach the employment rate of carnivores in San Juan Biological Corridor was evaluated - La Selva (CBSJLS) , Costa Rica , using camera traps at 38 sites , adjusted occupancy models for each species. Nine species of carnivores whose occupations ranged from 0.06 for the margay (*Leopardus wiedii*) and 0.68 for tolomuco (*Eira barbara*), being the coati (*Nasua narica*) tolomuco and ocelot (*Leopardus pardalis*) species with higher occupancy were detected 0.5. Several of the models had very high standard errors, probably due to low detectability of species. Given the variety of carnivore species recorded and detection of puma (*Puma concolor*) in four of the sites, it can be suggested that the CBSJLS has a high potential to maintain viable populations of mammals in general. It is important to promote the use of these models, as an alternative for monitoring species in protected areas , due to their relatively low cost , easy implementation , robustness , analysis of simplified data.

2:6:3

Title: **MODELOS DE CONECTIVIDAD FUNCIONAL PARA EL OCELOTE (*Leopardus pardalis*) Y GUATUSA (*Dasyprocta punctata*), EN ÁREAS DE LA CARRETERA INTERAMERICANA QUE CRUZA EL ACG, COSTA RICA**

[MODELS OF FUNCTIONAL CONNECTIVITY IN THE OCELOT (*Leopardus pardalis*) and agouti (*Dasyprocta punctata*) AREAS OF AMERICAN ROAD CROSSING THE ACG, COSTA RICA]

Author(s): Sáenz Joel C. y Lorena Torres
Email: jsaenz@una.cr
Country: Costa Rica

Abstract:

Spanish

En el Área de Conservación Guanacaste (ACG), Costa Rica, existen 15 pasos de fauna (alcantarillas) bajo la Carretera Interamericana Norte, carretera que separa a los Parques Nacionales Santa Rosa (PNSR) y Guanacaste (PNG). Entre las especies con mayor frecuencia de cruce a través de los 15 pasos de fauna se encuentra el ocelote (*Leopardus pardalis*) y la guatusa (*Dasyprocta punctata*). Se usaron ambas especies para elaborar un modelo de conectividad funcional sobre el área marginal de la Carretera Interamericana. El modelo, interpretó la movilidad de las especies sobre la carretera utilizando valores de conductancia (resistencia) propios de cada especie sobre los distintos usos del suelo en el área. Se tomó un área buffer alrededor de la carretera de forma rectangular de 14 x 13.5 km, tratando de incluir el área de influencia inmediata a los 15 pasos de fauna. Sobre esta capa (Shape), se identificó como parches focales o bosques fuentes de dispersión de las especies, aquellos parches de bosque seco que se encuentran en forma contigua y paralela a la carretera. Los modelos fueron elaborados de acuerdo a la teoría de circuitos propuesta por Mcrae y Shah (2008) usando Circuitscape 3.4.5 desarrollado por los mismos autores. Los modelos, mostraron tres áreas de alta movilidad de las especies con ausencia de pasos de fauna, y en las cuales, se debe tomar medidas de mitigación y conservación de la conectividad para la fauna frente a una ampliación a cuatro carriles de la Carretera Interamericana. También se identificaron pasos de fauna con conectividad alta no usados por guatusas y ocelotes, lo que se atribuyó en el caso del ocelote a restricciones en el tamaño de los pasos y, para la guatusa a las diferencias de uso del bosque seco, charrales y tacotales asociados a la Carretera Interamericana en distintas etapas de sucesión

English

In the Guanacaste Conservation Area (ACG), Costa Rica , there are 15 wildlife crossings (culverts) under the North American Highway, the road from Santa Rosa National Park (PNSR) and Guanacaste (PNG) . Among the species most frequently crossing through the 15 steps of fauna is the ocelot (*Leopardus pardalis*) and agouti (*Dasyprocta punctata*) . Both species were used to develop a model of functional connectivity on the marginal area of the Interamerican Highway. The model, interpreted the mobility of species on the road using conductance values (resistance) unique to each species on different land uses in the area. A buffer area around the road rectangular 14 x 13.5 km, trying to include the area immediately to the 15 wildlife crossings influence was noted. On this layer (Shape) , identified as focal forest patches or sources of dispersal of species , those patches of dry

forest found in contiguous and parallel to the road way . The models were developed based on circuit theory given by McRae and Shah (2008) using Circuitscape 3.4.5 developed by the same authors. The models showed three areas of high mobility of the species with the absence of wildlife passages, and in which , take mitigation and conservation of wildlife connectivity to face a widening to four lanes of the Inter-American Highway. Wildlife crossings with high connectivity not used by agoutis and ocelots were also identified, which was attributed in the case of ocelot to restrictions on the size of the steps and to the agouti to differences in use of dry forest and scrubland tacotales associated with the Inter-American Highway in different stages of succession.

.**2:6:4**

Title: **REPRODUCTIVE BIOLOGY FOR MONITORING RAINFOREST MAMMAL POPULATIONS THROUGH THE PARTICIPATION OF LOCAL COMMUNITIES**

Authors: Pedro Mayor and Mark Bowler
Email:
Country: Spain

Abstract:

In the tropical regions, wildlife subsistence hunting is a traditional source of food for rural human populations and one of the most important conservation issues. Ensuring sustainable wildlife hunting is important for both the long-term benefits that people get from wildlife and for the conservation of species and ecosystems. The conservation status of species and the implementation of conservation programs are often guided by assessments of the vulnerability to extinction or sustainability of hunting of the target species in a given area. A key parameter of standard models in sustainability analyses is measure the reproductive performance of a target species. Captive breeding systems could be appropriate for estimating maximum reproductive parameters, and studies conducted in wild populations are difficult and scarce. The study of genital organs from hunted animals permits us to increase our knowledge on the reproductive pattern of wild species living in nature. Local hunters could become passive samplers of a valuable biological material, which is usually discarded. We present a long-term methodology based on the active communal participation used for the estimation of wild reproductive rates in the North-eastern Peruvian Amazon. Between 2004 and 2013, the subsistence hunters in the Yavari-Mirín River collected biological samples of hunted preys from its usual subsistence hunting. Hunters were trained to remove all the abdominal and pelvic organs complete with the perineal region to avoid damage to the material. During the 96 month of study, hunters collected 1014 female genital organs of wild species. There was daily and monthly sampling of 0.35 and 10.5 female genital organs, respectively. Herein we present the most important reproductive parameters in wild populations of 9 species, including *Pecari tajacu, Tayassu pecari, Mazama Americana, Tapirus terrestris, Nasua nasua, Dasyprocta fuliginosa, Lagothrix poepigii, Cacajao calvus* and *Cuniculus paca.*

2:6:5
Title: **SISTEMA DE MANEJO PARTICIPATIVO DOS JACARÉS AMAZÔNICOS NAS RESERVAS DE DESENVOLVIMENTO SUSTENTÁVEL MAMIRAUÁ E AMANÃ, AMAZÔNIA BRASILEIRA**
Authors: Robinson Botero-Arias and Kelly Torralvo
Country: Brazil

7. Neo-tropical Animal **Ecology**

8. Genetics, phylogenetics and phylogeography of Neo-tropical **Carnivores**

9. Genetics, phylogenetics and phylogeography of **Primates**

9:8&9:1
Title: **PHYLOGENETICS AND PHYLOGEOGRAPHY OF TWO LARGE NEOTROPICAL RODENTS (CAPYBARA, *Hydrochoerus hydrochaeris*, HYDROCHAERIDAE AND PACA, *Cunniculis paca*, AGOUTIDAE; RODENTIA) BY MEANS OF MITOCHONDRIAL GENES: OPPOSITE PATTERNS**
Author(s): M. Ruiz-García, K. Luengas-Villamil, L. Leal, L. M. Bernal-Parra, J. M. Shostell
Email: **mruizgar@yahoo.es**
Country: Colombia
Abstracts:

Two species of large Neotropical rodents, sampled throughout Colombia, Ecuador, Peru, Bolivia and Brazil, were studied by means of the sequences of two mitochondrial genes (D-loop and Cyt-b). These species were the capybara (Hydrochoerus hydrochoeris; n = 78) and the paca (Cunniculus paca; n = 120). We comparatively analyzed the possible genetic structure and phylogeography of these both species, which showed opposite trends in different population genetics results. The main results were as follows: 1- Both species presented very high levels of gene diversity for both mitochondrial markers, but paca yielded higher levels than the capybara; 2- Capybara showed a noteworthy and significant amount of genetic heterogeneity among different populations, although the mt D-loop gene discriminated better the populations than mt Cyt-b. Contrarily, paca yielded low levels of gene heterogeneity among different populations, being these inconspicuous genetic heterogeneities similar for both mitochondrial genes; 3- Different Bayesian female effective numbers were estimated, with the paca showing higher values than the capybara. For both species, mt Cyt-b yielded effective sizes higher than mt D-loop. Identically, the Bayesian gene flow estimates were considerably superior among paca populations than among capybara populations; 4- Different analyses revealed population expansions in both species. Only the northern Colombian capybara population showed some evidence of a population

bottleneck; 5- An isolation by distance analysis showed that the capybara yielded a very positive and significant relationship between genetic and geographic distances, whilst among paca populations there was not any significant relationship between both distances; 6- The phylogenetic analyses showed that the capybara clusters were conformed following different geographical, meanwhile the paca results did not confirm any putative ESUs or subspecies in the geographical area studied. The mitochondrial haplotype splits were older in capybara than in the paca for both markers studied, beginning this process, in both species, during the Miocene. In the case of the capybara, the original foci of dispersion seems to be the Western Amazon, meanwhile for the paca, this origin is not clear with our results. These results agree quite well with the fact that the dispersion of the capybara is restricted by the existence of rivers, which could be disconnected along the geological history of South America, whilst the paca is not restricted by any effective geographical barrier in the geographic area studied; 7- Although many authors consider the trans-Andean capybara population as a different species (H. isthmus), our molecular results agree better with this population as a geographical subspecies.

9:8&9:2

Title: **MOLECULAR PHYLOGENETICS OF THE WHITE-LIPPED PECCARY (*Tayassu pecari*)—USING MITOCHONDRIAL CONTROL REGION SEQUENCES AND MICROSATELLITES, DID NOT CONFIRM MORPHOLOGICAL SUBSPECIES IN NORTH WESTERN SOUTH AMERICA**

Author(s): M. Ruiz-García, M. Pinedo-Castro, K. Luengas-Villamil, C. Vergara, J. A. Rodriguez, J. M. Shostell
Email: **mruizgar@yahoo.es**
Country: Colombia

Abstracts:

We sequenced 59 peccaries (44 white-lipped peccaries, Tayassu pecari, and 15 collared peccaries, Pecari tajacu) at the mitochondrial control-region gene. We also genotyped 78 white-lipped peccaries at three DNA microsatellites representing the four putative morphological subspecies (spiradens, aequatoris, pecari and albirostris) present in northwestern South America (Colombia, Ecuador, Peru and Bolivia). Our results showed: 1- The estimated diversity of the T. pecari population at the mitochondrial gene was extremely high, whereas the average gene diversity for microsatellites was medium to high and considered similar to that observed in European pig breeds. 2- There was no significant genetic heterogeneity among the quoted putative morphological subspecies at the mitochondrial marker, but we did detect a significant but relatively small genetic heterogeneity using microsatellites with albirostris being the unique differentiated group. 3- The phylogenetic mtDNA trees showed that haplotypes were intermixed independently of their “a priori” subspecies classification. Also, the microsatellite assignation analyses yielded low percentages of well-classified individuals when the analysis considered the geographical morphology of sub-species. Thus, the molecular results disagree with the putative morphological subspecies of T. pecari in northwestern South America. 4- No clear historical demographic changes

were detected with the mt control-region sequences.
These genetic results were discussed in the context of the ecological and social structure characteristics of T. pecari.

9:8&9:3

Title: **HOW MANY GENERA AND SPECIES OF WOOLLY MONKEYS (ATELIDAE, PLATYRRHINE, PRIMATES) ARE THERE? THE FIRST MOLECULAR ANALYSIS OF LAGOTHRIX FLAVICAUDA, AN ENDEMIC PERUVIAN PRIMATE SPECIES**

Author(s): M. Ruiz-García and M. Pinedo-Castro
Email:
Country: Colombia

Abstract:

We sequenced a total of 141 Neotropical woolly monkeys at the mitochondrial genes COI and COII to obtain new insights on their phylogeography and phylogenetic relationships. For the first time, eight individuals of the Peruvian endemic and extremely rare yellow-tailed woolly monkey (flavicauda) were sequenced at these genes and compared with other Lagothrix taxa (poeppigii, lagotricha, lugens and cana). The main results obtained were as follows: 1- L. flavicauda showed null gene diversity for these genes, whereas poeppigii and lugens showed high levels of gene diversity and lagotricha and cana showed more modest levels of gene diversity. The absence of gene diversity found for L. flavicauda strongly supports that it is one of the 25 more endangered primates on earth; 2- Our genetic distance and phylogenetic analyses, which included many cases of genetic introgression and recent hybridization, suggest that all the woolly monkeys could be included in one unique genus, Lagotrix, divided into two species L. flavicauda and L. lagotricha. The last species is divided into at least four subspecies. Our molecular results agree with Fooden's (1963) classification and clearly do not support the classification proposed by Groves (2001)—indiscriminately applying the phylogenetic species concept (Oreonax flavicauda and four species of Lagothrix); 3- Poeppigii was the first taxon within L. lagotricha to experience a mitochondrial haplotype diversification, whilst cana and lagotricha experienced more recent mitochondrial haplotype diversification; 4- Poeppigii and lagotricha were the taxa which showed more evidence of population expansions in different Pleistocene periods, whereas lugens experienced a population declination in the last 25,000 YA.

9:8&9:4

Title: **GENETIC CHARACTERIZATION AND STRUCTURE OF THE ENDEMIC COLOMBIAN SILVERY BROWN BARE-FACE TAMARIN, *SAGUINUS LEUCOPUS* (CALLICTRICHINAE, CEBIDAE, PRIMATES) MOLECULAR ANALYSIS OF *Lagothrix flavicauda*, AN ENDEMIC PERUVIAN PRIMATE SPECIES**

Author(s): Manuel Ruiz-García, Pablo Escobar-Armel, Norberto Leguizamon, Paola Manzur, Myreya Pinedo-Castro, Joseph M. Shostell
Email: **mruizgar@yahoo.es**
Country: Colombia

Abstract:

We analyzed 115 Saguinus leucopus, proceeding from four Colombian departments (Antioquia, Bolivar, Caldas and Tolima), for 701 base pairs (bp) at the mt COII gene and at 10 microsatellite loci to estimate gene diversity levels, possible molecular subspecies and historical demographic changes in this species. This endemic Colombian species showed an elevated gene diversity at this gene, although its geographical distribution is very restrictive and extremely threatened by habitat fragmentation. The mt COII gene did not show any geographical structure in the distribution of the haplotypes within this species, but they showed a noteworthy population expansion throughout the history of this species. A Bayesian analysis showed that the haplotype diversification of this species began around 1.6 million of years ago (MYA), whilst a haplotype network yielded the beginning of this haplotype diversification around 0.5-0.6 MYA. Forty-seven individuals, of these 115 individuals, were analyzed for 10 DNA microsatellites. Also the genetic diversity was relatively elevated for this kind of markers, comparable to those in other Neotropical monkeys with a wider geographical distribution. Two gene pools were detected with the microsatellites, one in the northern distribution area (Antioquia) and other in the southern distribution area (Tolima). No tests detected any bottleneck affecting this population, however two procedures (k test and Kimmel et al. 1998 test) detected significant population expansion for the microsatellite markers such as at the mt COII gene.

Title: **ESTUDIO COMPARATIVO DEL JAGUAR (*PANTHERA ONCA*) Y LA COMUNIDAD DE VERTEBRADOS TERRESTRES EN ZONAS CON DIFERENTES PRESIONES DE CACERÍA DE SUBSISTENCIA EN EL ALTO CAURA, VENEZUELA.**
[COMPARATIVE STUDY OF THE JAGUAR (*PANTHERA ONCA*) AND THE COMMUNITY OF TERRESTRIAL VERTEBRATES IN AREAS WITH DIFFERENT PRESSURES OF SUBSISTENCE HUNTING IN THE UPPER CAURA, VENEZUELA]

Authors: Lucy Perera-Romero[1], Isabel Villasmil[1] , David Prieto[1], Williams Emeyuwe Sarmiento[2], Elso Espinoza[2] y Orlando Rodríguez[2]
Email: lperera@wcs.org
Country: Venezuela

Abstract:
Spanish
Los bosques del Alto Caura del Macizo Guayanés Venezolano, comprenden los hábitat ancestrales de comunidades indígenas de las etnias Ye'kwana y Sanema, quienes practican tradicionalmente la cacería y pesca de subsistencia. Los patrones de sedentarización que ocurrieron a mitad del siglo XX, ha llevado al agotamiento de recursos alrededor de muchas comunidades. Conocer el impacto que tiene la cacería de subsistencia sobre la fauna, es una tarea fundamental para dirigir medidas de manejo que ayuden a la recuperación de las especies más afectadas. Esto es indispensable para la seguridad alimentaria de las comunidades así como para la conservación de especies amenazadas como el mono araña de vientre amarillo (*Ateles belzebuth*) y el Jaguar (*Panthera onca*). Con este fin, se ha venido evaluando la fauna en dos áreas de la cuenca Alta del Río Caura: las afluencias del Río Ka'kada, una zona deshabitada con relativamente baja presión de cacería, y los bosques de las afluencias del Río Yudi, ubicados alrededor de comunidades Sanema de Yudiña y Ayawaña. El estudio se realiza por medio de censos en trayectos lineales para primates y aves cinegéticas así como por medio de cámaras trampa para especies nocturnas y elusivas. Para este análisis se utilizan datos de trayectos lineales del Ka'kada de los años 2008, 2009 y 2010 (con 161, 266 y 273Km de esfuerzo respectivamente) y de Yudiña-Ayawaña correspondientes al 2013 (con 180 Km de esfuerzo). Los datos de cámara trampa se recogieron en la misma área de los trayectos lineales en los años 2011 (Ka'kada) y 2013 (Yudiña-Ayawaña). Luego de estandarizar de acuerdo al esfuerzo empleado en cada lugar de estudio, se presentan los resultados obtenidos por ambos métodos en cuanto al número de especies, abundancias relativas y probabilidades de detección para todas las especies, así como la abundancia y densidad de Jaguares. Si bien el número de especies registradas se mantiene similar para las dos áreas, los censos en trayectos lineales dejaron de registrar algunas especies de aves y mamíferos en los bosques cercanos a las comunidades (41 vs 21 especies registradas en total). Las principales ausencias en los registros fueron aves de las familias Psitacidae y Cracidae y mamíferos primates y pecaríes. En cuanto a las especies susceptibles a la cacería cuya presencia se registro en ambas áreas de muestreo, todas presentaron tasas de encuentro (T.E./10Km) mayores en los bosques del Río Ka'kada en comparación con los bosques cercanos a las comunidades: *Ateles belzebuth* (Atelidae) (0.80 vs. 0.11), *Tapirus terrestris* (Tapiridae)(0.12 Vs. 0.05), *Mitu tomentosa* (Cracidae) (0.33 vs. 0.16) y *Crax alector* (Cracidae)

(1.00 vs. 0.27). Los resultados dejan ver la magnitud del impacto de la cacería sobre las diferentes especies así como características de ambas comunidades de vertebrados terrestres. De igual modo, los resultados son relevantes para guiar acciones de manejo comunitario no solo en Yudiña y Ayawaña si no también en otras comunidades del Caura.

English

The forests of the Upper Caura the Venezuelan Guayana Shield, comprise the ancestral lands of indigenous communities Sanema Ye'kwana and ethnicity, who traditionally practice subsistence hunting and fishing. Sedentary patterns that occurred half of the twentieth century, has led to the depletion of resources around many communities. Knowing the impact of subsistence hunting on wildlife, is a key to direct management measures to assist the recovery of the affected species task. This is essential for food security of communities and the conservation of endangered species like the yellow-bellied spider monkey (Ateles belzebuth) and Jaguar (Panthera onca). To this end, we have been evaluating fauna in two areas of the Upper Caura River basin: the River Ka'kada inflows, an uninhabited area with relatively low hunting pressure and forest inflows of Yudi River, located communities around Sanema Yudina and Ayawaña. The study was performed by means of linear paths to census primates and game birds as well as by camera traps for nocturnal and elusive species. For this analysis data Ka'kada linear paths of the years 2008, 2009 and 2010 (161, 266 and 273km respectively stress) and Yudina-Ayawaña corresponding to 2013 (with 180 km of effort) are used. Camera trap data were collected in the same area of the linear paths in the years 2011 (Ka'kada) and 2013 (Yudina-Ayawaña). After standardization according to the effort expended in each study, the results obtained by both methods in terms of number of species, relative abundance and detection probabilities for all species and the abundance and density of Jaguars are presented. Although the number of recorded species remains similar for the two areas, surveys in linear paths left to record some birds and mammals in the woods nearby communities (41 vs 21 species recorded in total). Major absences records were birds and families Psitacidae Cracidae mammals and primates and peccaries. As for the susceptible species to hunt whose presence was recorded in both sampling areas, all submitted encounter rates (TE/10Km) higher in the forests of Rio Ka'kada compared with nearby forests to communities: Ateles belzebuth (Atelidae) (0.80 vs. 0.11), Tapirus terrestris (Tapiridae) (0.12 vs. 0.05), Mitu tomentosa (Cracidae) (0.33 vs. 0.16) and Crax alector (Cracidae) (1.00 vs. 0.27). The results reveal the magnitude of the impact of hunting on species and characteristics of both terrestrial vertebrate communities. Similarly, the results are relevant to guide management actions not only in community Yudina and Ayawaña but also in other communities in the Caura

B. Conservation Management of Animal species with Conflicting Conservation Status

10. Assessments of conflicts between Humans and the Wild Fauna

7:10:1

Title: **IMPACTOS DE PERROS ASILVESTRADOS EN LA COMUNIDAD DE MAMÍFEROS NATIVOS DE LOS ANDES ECUATORIANOS [IMPACTS OF FERAL DOGS IN THE COMMUNITY OF NATIVE MAMMALS OF THE ECUADORIAN ANDES]**

Author(s): Galo Zapata-Ríos & Lyn C. Branch
Email: **galo@ufl.edu**
Country: USA

Abstract:

Spanish

Los perros domésticos son la especie más abundante de carnívoro en el planeta, y la población global de perros ha sido estimada en aproximadamente 700 millones de individuos. Aunque la gran mayoría de perros son mantenidos como mascotas, un gran porcentaje (75%) vagan libremente, y algunas poblaciones inclusive se encuentran asilvestradas. La densidad poblacional de los perros varía grandemente entre localidades, pero en general es muy alta en comparación con la densidad de los depredadores nativos (e.g. 2,5-76,8 individuos/km2). Muchas de las poblaciones de perros están restringidas a áreas urbanas y suburbanas; sin embargo, en áreas rurales y silvestres pueden afectar a las especies nativas a través de depredación, competencia, interferencia y la transmisión de enfermedades. Además, en muchas localidades donde los depredadores nativos han sido extirpados o están ausentes, los perros asilvestrados pueden funcionan como depredadores ápice. En este contexto, evaluamos los impactos de perros asilvestrados en la comunidad de mamíferos nativos en los Andes septentrionales del Ecuador. En el Parque Nacional Cayambe Coca comparamos abundancia relativa, patrones de actividad, y uso de hábitat en áreas con y sin perros. Para estudiar a los perros y las especies nativas de mamíferos utilizamos tres métodos: transectos en línea, trampas fotográficas, y muestreos de huellas y otros signos. En las áreas donde los perros estuvieron presentes, cuatro especies nativas de mamíferos estuvieron ausentes (Nasuella olivacea, Mustela frenata, Cuniculus taczanowskii y Pudu mephistophiles) y otras seis tuvieron estimaciones de abundancia relativa significativamente menores en comparación a áreas donde los perros estuvieron ausentes (Puma concolor, Lycalopex culpaeus, Tremarctos ornatus, Conepatus semistriatus, Tapirus pinchaque y Mazama rufina). La presencia de los perros además alteró significativamente los patrones de actividad de tres especies: Tremarctos ornatus, Tapirus pinchaque y Mazama rufina. Dado que los perros utilizaron de acuerdo a su disponibilidad todos los tipos de hábitat en las áreas de muestreo, ninguna de las especies nativas presentó cambios en sus patrones de uso de hábitat. La presencia de perros asilvestrados tiene impactos negativos en la comunidad de mamíferos nativos en el Parque Nacional Cayambe Coca, y las interacciones entre estas especies seguramente incluyen una mezcla de efectos letales y no

letales (e.g. depredación, competencia). Los resultados de este estudio tienen implicaciones para la protección de áreas naturales donde los perros asilvestrados están presentes, en especial donde existen especies nativas endémicas y amenazadas.

English
Domestic dogs are the most abundant species of carnivore on the planet, and the overall dog population has been estimated at approximately 700 million individuals. Although the vast majority of dogs are kept as pets , a large percentage (75 %) roam freely , and some are even feral populations . The population density of dogs varies widely among locations, but overall is very high compared to the density of native predators (eg individuals/km2 2.5 to 76.8) . Many dog populations are restricted to urban and suburban areas ; however, in rural and wilderness areas can affect native species through predation, competition , interference, and disease transmission . Moreover, in many localities where native predators have been removed or absent , feral dogs can function as apex predators. In this context , we evaluated the impacts of feral community of native mammals in the northern Andes of Ecuador dogs. In Cayambe Coca National Park compare relative abundance , activity patterns, and habitat use in areas with and without dogs. To study the dogs and native mammal species use three methods: line transects , camera traps , and sampling of tracks and other signs. In areas where dogs were present , four native species of mammals were absent (Nasuella olivacea , Mustela frenata , Cuniculus taczanowskii and Pudu mephistophiles) and six had significantly lower estimates of relative abundance compared to areas where dogs were absent (Puma concolor , Lycalopex culpaeus , Tremarctos ornatus , Conepatus semistriatus , Tapirus pinchaque Mazama and rufina) . The presence of dogs also significantly alter the activity patterns of three species : Tremarctos ornatus , Tapirus pinchaque Rufina and Mazama . Since dogs used according to their availability all habitat types in the sample areas, none of the native species introduced changes in their patterns of habitat use. The presence of feral dogs have negative impacts on the community of native mammals in the Cayambe Coca National Park, and the interactions between these species probably include a mix of lethal and non-lethal effects (eg predation, competition) . The results of this study have implications for the protection of natural areas where wild dogs are present , especially where endemic and endangered native species there .

7:10:2
Title: **EVALUATING CONFLICT OVER AVIAN RESOURCES IN GUYANA: TOURISM VERSUS WILDLIFE TRADE**
Author(s): Calvin R. Bernard, Nakesha Fredericks and Raihaana Ali
Email: raihaana.ali@uog.edu.gy
Country: Guyana
Abstract:

Guyana is home to 816 documented species of birds distributed across diverse ecosystems; and human communities across Guyana have been dependent on bird populations as a valuable natural resource for hundreds of years. Ancient historical records tell of indigenous communities hunting some bird species for food, while at the same time

giving almost god-like status to others and affording them protection for that reason. Ever since the arrival of the Europeans, birds have been transported from the neotropics to more temperate regions. For several decades the trade in wild species has been a lucrative business for countries like Guyana, and bird species have been among the most valuable in terms of volume traded and value of the trade – though avian influenza has affected the trade significantly in most recent years. Ecotourism has created traffic in a different direction for the movement of people from temperate regions to the neotropics, to view birds in their natural habitats.

Logically these two streams of traffic have the potential to create conflict in places like Guyana; which has a long history of trading birds and has been recently recognized as a premier birding destination. We evaluated the existence of such conflict in Guyana in two ways. Firstly we assessed competition between the wildlife trade and ecotourism for bird species by determining overlap between these two activities as it relates to the 15 bird species in highest demand by both markets. Secondly we assessed competition for populations of those bird species of highest value to both markets by determining overlap between trapping areas and birding destination in Guyana.

We found that ecotourism and the wildlife trade targeted almost completely different species; only one species (Festive Amazon - *Amazona festiva*) was in high demand in both markets. While there was not adequate information to determine what specific localities birds were captured from for the trade between 2003 and 2007, anecdotal information indicated that trapping for the wildlife trade does not occur in the areas used for birding ecotourism. We therefore conclude that there is little threat of conflict between these two activities in Guyana, and that both markets may be accessed for the good of the country.

7:10:3

Title: **ACTIVIDADES PETROLERAS EN LA AMAZONÍA: ¿NUEVA AMENAZA PARA LAS POBLACIONES DE FAUNA SILVESTRE? [OIL ACTIVITIES IN THE AMAZON: NEW THREAT TO WILDLIFE POPULATIONS?]**

Authors: Pedro Mayor, Antoni Rosell, Mar Cartró-Sabaté, Martí Orta-Martínez
Email:.....
Country: Spain

Abstract:

Spanish

En la Amazonía peruana, los lotes petroleros abarcaban el 68% de los territorios indígenas, el 83% de las reservas territoriales propuestas para pueblos indígenas en aislamiento voluntario y el 17% de los 153.539 km^2 de las áreas protegidas. El gobierno peruano sigue promoviendo fuertemente el desarrollo petrolero en un proceso definido como el segundo *boom* de exploración de petróleo. Esta intensa actividad petrolera ha provocado graves impactos socio-ambientales, debido al vertido de las aguas de formación al ecosistema como una práctica habitual por parte de las empresas petroleras desde el inicio de sus actividades en el año 1971. Esta problemática ha obligado al Ministerio del Ambiente de Perú a aprobar el estado de emergencia ambiental para las cuencas del Pastaza,

Corrientes y Tigre. A pesar de esta intensa actividad petrolera existe escasa información útil sobre el impacto de estas actividades sobre la fauna silvestre. Debido a la elevada salinidad de las aguas de formación asociadas al petróleo, es posible que la fauna se acerque a los derrames de crudo para ingerir suelos y abastecerse de nutrientes esenciales que proporcionan los vertidos, e indirectamente ingerir hidrocarburos y metales pesados. Para documentar el consumo de suelo contaminado por los vertidos de petróleo por parte de la fauna silvestre, se colocó una red de cámaras trampa con infrarrojos para registrar el comportamiento de mamíferos terrestres en la cuenca del Pastaza y del Corrientes. Los registros nos han permitido observar que diversas especies de mamíferos silvestres (*Tapirus terrestris*, *Cuniculus paca, Pecari tajacu,* y *Mazama americana*) están consumiendo suelos contaminados por vertidos petroleros. Este es el primer estudio que demuestra que diferentes especies de mamíferos están ingiriendo suelos y aguas de áreas contaminadas con compuestos petrogénicos, convirtiéndose este hecho en una vía de exposición importante para la fauna, e indirectamente para las comunidades humanas.

English

In the Peruvian Amazon, the oil blocks covering 68% of the indigenous territories, 83% of the proposed territorial reserves for indigenous peoples in voluntary isolation and 17% of the 153,539 km2 of protected areas. The Peruvian government is heavily promoting oil development in a process defined as the second oil exploration boom. This intense oil activity has caused serious socio-environmental impacts from the discharge of produced water to the ecosystem as standard practice by oil companies since the beginning of its activities in 1971. This problem has forced the Ministry of Scene Peru to adopt the state of environmental emergency basins Pastaza, Corrientes and Tigre. Despite this intense oil activity there is little useful information about the impact of these activities on wildlife. Due to the high salinity of formation waters associated with oil, it is possible that wildlife approaching oil spills to ingest soil and supplies essential nutrients that provide discharges and indirectly ingesting hydrocarbons and heavy metals. To document the consumption of soil contaminated by oil spills by wildlife, a network of infrared camera traps are placed to record the behavior of terrestrial mammals in the basin of the Pastaza and Corrientes. The records that have allowed us to observe various species of wild mammals (*Tapirus terrestris*, *Cuniculus paca, Tajacu peccary* and *Mazama americana*) are consuming contaminated by oil spills soils. This is the first study demonstrating that different mammalian species are ingesting contaminated soil and water areas with petrogenic compounds, making this fact in a significant exposure route for wildlife, and indirectly to human communities.

11. Management for species introduced, harmful species and species Pest Control

7:11:1

Title: **EVALUACIÓN DE LOS SEIS PRIMEROS AÑOS DEL PROYECTO REINTRODUCCIÓN DEL GUANACO (*Lama guanicoe*) EN LAS MONTAÑAS DEL CENTRO DE ARGENTINA**

Author(s): Barri, Fernando R
Email: fbarri@efn.uncor.edu
Country: Argentina

Abstract:
El proyecto de reintroducción del guanaco (*Lama guanicoe*) en el Parque Nacional Quebrada del Condorito, en la región montañosa del centro de Argentina, inició en el año 2007 y continúa hasta la fecha. El objetivo de esta reintroducción de esta especie extinta localmente fue contribuir a la restauración ecológica del área protegida, dado que el frágil ecosistema de las sierras grandes de la Provincia de Córdoba sufrió una fuerte degradación producto de la cría de ganado doméstico durante siglos, a la vez que requiere de mantener una herbivoría de bajo impacto para mantener la heterogeneidad espacial que se requiere para conservar toda su biodiversidad. Las primeras liberaciones de 2007 se realizaron sin que los individuos pasaran por un período de pre-adaptación, lo que hizo que la mortalidad inicial fuera muy elevada, en tanto que las segundas liberaciones de 2011 y 2012 se realizaron a *posteriori* de que los individuos pasaran por más de cuarenta días en un corral diseñado a tal fin, lo que incrementó la tasa de supervivencia inicial post-liberación. En el transcurso de los seis años que lleva el proyecto de reintroducción se ha realizado un monitoreo permanente de la población de guanacos establecida en el Parque. Se observó que la tasa de natalidad y mortalidad variaron por diversas causas que deberán ser tenidas en cuenta al momento de tomar medidas de manejo. Entre ellas se detectó el impacto de los alambrados y la depredación por puma como factores claves de mortalidad. A su vez, determinó que es necesario incrementar el número de individuos de los grupos reproductivos y lograr una mayor sincronía de las pariciones para que la tasa de reclutamiento poblacional se incremente. Sin bien los estudios ecológicos de base demuestran que los individuos se adaptaron bien a su nuevo ambiente y contribuyen a restaurar el ecosistema, aún es necesario nuevos refuerzos poblaciones hasta alcanzar un tamaño mínimo viable de la población que asegure su perpetuidad en el tiempo.

7:11:2
Title: **THE AGOUTI AND PARROT: THE TOBAGO'S PERSPECTIVE**
Author(s): Howard Mario Robin
Email:
Country: Trinidad and Tobago [T&T]
Abstract:
Tobago is 116 square miles with a population of 60,874 as published by the Central Statistical Office (CSO) in 2011. Considering this small space a drastic increase or reduction in the population of wildlife species can have far reaching consequences. Over the years complaints have been made, both formally and informally, to the Department of Natural Resources and the Environment (DNRE) concerning the destruction that the agouti, and parrot inflict on farmers' produce. The focus of this study is to document the experiences of a sample of farmers, agricultural extension officers, hunters and game wardens with the use of surveys and visual records. The implementation of a two (2) year moratorium on hunting by the Government of Trinidad and Tobago (GOTT) that took effect on October 1st 2013 has been a major point of national contention and debate on the twin island republic state. The moratorium is a response to possible over exploitation of some animal population. A study of this nature will be beneficial in assisting managers and policy makers in their efforts to resuscitate the agriculture sector by assessing the present affects by agouti and parrots and aid in charting the way forward. It will also provide data on the status of the agouti and parrot in the different areas of Tobago, evaluate the challenges that they pose to the farmers and identify the areas of greatest concern.
Random sampling will be used to determine the number of farmers to be surveyed out of a population of active farmers for each of the eight farming districts in Tobago. A confidence level of 95% and confidence interval of 5 are the parameters set for determining the sample size. The surveys will then be administered within the eight farming districts in Tobago, for 6 weeks. The survey results will be analyzed utilizing a statistical software package.

7:11:3
Title: **THE AGOUTI (*Dasyprocta leporina*), A PEST OF TOBAGO'S ROOT CROPS AND PUMPKIN?**
Author(s): William Mollineau, Kerry Alfred, Francis Davis, Ricardo Hospedales
Email: william.mollineau@utt.edu.tt
Country: T&T
Abstract:
Tobago is the smaller (300km^2) of the twin island state of the Republic of Trinidad and Tobago. In January of 2014 reports of agouti (*Dasyprocta leporina*) damaging crops in Tobago were surfaced during the call segment of a radio programme. In February 2014 a preliminary investigation of this Neo-tropical pest was conducted in the Plymouth and Moriah areas as these were the villages that reportedly suffered the heaviest losses due to this rodent. Four farms were visited and the farmers interviewed face to face. They were asked to recall their experiences with the agouti and their

crops. In some instances the farmers recorded the damage. The damage was assessed by expressing the losses as a percentage of the weekly harvest for the crops' production period. The crops attacked by the agouti included cassava/yucca (*Manihot esculenta*), sweet peppers (*Capsicum annuum*), pumpkin (*Cucurbita maxima*), and potatoes (*Ipomoea batatas*). Farmers reported estimated 30% and 33% losses for cassava and potatoes, respectively, due to agouti damage. The rodents would dig up the root tubers and carry them away for feeding. The attacks occurred at any time after the root tubers began to develop. Many plants survived the agoutis' attack and continue to grow because not all roots were destroyed. However this damage would not be discovered until harvest because the plants appear normal until they are uprooted to harvest the cassavas or potatoes. Average losses for pumpkin ranged from 35% to 100% and losses for sweet pepper were reported between 4% and 10%. Control and prevention measures included placing scarecrows in the field, various baited traps, poisons disguised in fruits and root crops, and gun shots. These had very little or no impact in discouraging this eatable rodent pest. However an Electronic Pest Chaser was also employed temporally on one farm. This farmer reported no agoutis or signs of their damage were observed during this period. The farmer concluded that it produced some positive results but the implementation time was too short for any definite evaluation. It is suggested that there is enough preliminary evidence to warrant a scientific investigation to evaluate the severity of the agouti's pest activities, and control and prevention measures.

7:11:4

Title: **MONITOREO DE LA PREDACIÓN EN GANADO POR JAGUARES Y PUMAS EN LA ESTANCIA AURORA: DESARROLLO DE ESTRATEGIAS DE MANEJO PARA LA CONSERVACIÓN Y LA SUSTENTABILIDAD**

[MONITORING OF THE PREDATION ON LIVESTOCK BY JAGUARS AND PUMAS IN THE STAY AURORA: DEVELOPMENT OF MANAGEMENT STRATEGIES FOR THE CONSERVATION AND SUSTAINABILITY]

Author(s): Rosalia Fariña; Roy Mc Bryde Jr; Sybil Zabala; Francisco Tomboly
Email: rosyfarina@rieder.net.py
Country: Paraguay

Abstract:

En Paraguay, el resultado de las actividades productivas humanas se observa en forma de paisajes agropecuarios y fragmentos con vegetación nativa, en el mejor de los casos, indistintamente del tipo de uso que se haya realizado del mismo (agricultura, ganadería, explotación forestal, etc). Históricamente, el jaguar se distribuía en todo el Paraguay, sin embargo con la pérdida de casi el 95% del bosque atlántico del Alto Paraná, las mayores poblaciones se dan actualmente en la ecorregión chaqueña, donde actualmente se da la presión de las transformaciones con un promedio de 500 ha por día, con la consecuente degradación y pérdida de hábitats muy acelerados, que influye en los procesos naturales de los ecosistemas, provocando cambios que van desde la pérdida de algunas especies (como las especies presa de los jaguares y pumas) hasta la transformación completa del hábitat.

La práctica de una ganadería extensiva y generalmente poco manejada ha facilitado la predación de ganado por parte de jaguares y pumas provocando la persecución de estas especies por parte de los ganaderos quienes en muchos de los casos, aun cuentan con sus correspondientes "tigreros" para controlarlos lo que provoca que sean exterminados ni bien sean detectados. Además de estas amenazas a los jaguares, también existe un vacío en el conocimiento sobre su estado, distribución y ecología.

La Estancia Aurora, localizada en la Chaco bajo, es una estancia ganadera de muchas décadas de experiencia, donde desde hace aproximadamente 10 años, se cumple la orden interna de no matar a los jaguares ni pumas, ni aun en los casos que éstos sean causantes de predación, de los cuales se llevan registros que indican valores entre 31 -9 cabezas perdidas entre las épocas de alta y baja predación, sin diferenciar al predador.

Radio collares colocados a jaguares en estudios previos brindaron información sobre la alta presión que estos individuos sufren, considerando que 1a mayor parte de los individuos monitoreados, fueron muertos antes del año de seguimiento. Así como el hecho de encontrar hembras con cría, lo que alienta sobre el futuro de esta población.

Registros con cámaras trampa indicaron la alta riqueza de biodiversidad existente, con registros confirmados de de Tany cati, Kurei, Tagua, Chancho alzado, Guazu vira, Guazu pyta, Jurumi, Kaguare, Aguara guazú, Aguara-i, Aguara pope, Coati, Aguti, Aguti pac, Carpincho, Mborevi, Jaguarete, Puma, Ocelote, Jaguarete-i, Jaguarundi, Tapiti, Lobope, Tatu bolita, Tatu hu, Tatu poju, yacaré, eira barbara.

La oportunidad que brinda la información inicialmente generada en esta propiedad, permite la posibilidad de realizar más estudios y acciones para mantener poblaciones estables de jaguares al nivel nacional, con subpoblaciones monitoreadas y gestionadas, así como evaluar el papel de los corredores entre áreas de reservas forestales y bosques protectores de causes hídricos, cumpliendo así con las sugerencias determinadas en el trabajo conjunto realizado con WCS Bolivia, para la conservación de las especies de grandes felinos en el Gran chaco.

In Paraguay, the result of human production activities can be seen in the form of agricultural landscapes and fragments with native vegetation, in the best cases regardless of the type of use that have been made from the same (agriculture livestock, logging, etc).

Historically% 2C the jaguar was distributed in all the Paraguay% 2C however with the loss of almost 95% of the Atlantic forest of the Alto Paraná% 2C the largest populations are currently in the Chaco ecoregion% 2C where there is now an pressure of the transformations with an average of 500 ha per day% 2C with a consequent degradation and loss of habitats very accelerated% 2C which influences the natural processes of the ecosystems% 2C causing changes ranging from the loss of some species (such as prey species for jaguars and pumas) until the complete transformation of the habitat.

The practice of a extensive livestock farming and generally little handled has facilitated the livestock predation by jaguars and pumas causing the persecution of these species by the ranchers who in many cases% 2C still have with their corresponding "tigreros" to control this means that they are

annihilated nor well are detected. In addition to these threats to the jaguars% 2C there is also a gap in knowledge about their state% 2C distribution, and ecology.

The Stay Aurora% 2C located in the Chaco under% 2C is a cattle ranch from many decades of experience% 2C where since about 10 years ago% 2C meets the internal order not to kill the jaguars or pumas% 2C even in the cases that they are causing predation% 2C of which are there records that indicate values between 31 -9 heads losses between the periods of high and low predation% 2C without differentiating the predator.

Radio collars placed to jaguars in previous studies provided information about the high pressure that these individuals suffer% 2C 1a considering that most of the individuals monitored% 2C were killed before the year of follow-up. As well as the fact to find females with breeding% 2C which encouraged about the future of this population.

Records with camera trap indicated the high biodiversity richness existing% 2C with confirmed records of of Tany cati Kurei% 2C% 2C% 2C Tagua Chancho lump sum% 2C Guazú vira% 2C Guazú pytã Jurumi% 2C% 2C% 2C Kaguare aguará guazú% 2C aguará-i% 2C Aguará pope Coati% 2C% 2C% 2C Agouti Agouti pac Capybara% 2C% 2C% 2C Mborevi Jaguarete Puma% 2C% 2C% 2C Ocelot Jaguarete-i% 2C% 2C Jaguarundi Tapiti Lobope% 2C% 2C Tatu bolita% 2C% 2hu Tatu Tatu poju C% 2C% 2C yacaré eira Barbara.

The opportunity that provides the information initially generated in this property% 2C allows for the possibility of carrying out further studies and actions to maintain stable populations of jaguars at the national level% 2C with subpopulations monitored and managed% 2C as well as to evaluate the role of corridors between areas of forest reserves and protective forests of water causes% 2C thus complying with the suggestions identified in the joint work with WCS Bolivia% 2C for the conservation of the species of big cats in the Gran Chaco

12. Conservation of communities, ecosystems and landscapes for the wildlife

13. Influence of Climate Change on the Wild Fauna

14. Fauna in Protected Areas

15. Socio-economics aspects of the Wild Fauna

16:34&14&15:1

Title: **EFFECTS OF AGOUTI (*Dasyprocta leporina*) MANURE ON PAT CHOI (*BRASSICA CHINENSIS*) YIELD AND QUALITY**

Author(s): Gaius Eudoxie
Email: gaius.eudoxie@sta.uwi.edu
Country: T&T

Abstract:
Plant performance and nutritional quality depends on nutrient source, especially where mineralization is a precursor to available nutrient forms. Comparing the effects of agouti manure to other popular nutrient sources is germane for verifying its use in sustainable vegetable cropping. A pot study was conducted comparing similar rates of agouti and cattle manure to inorganic fertiliser on the yield and nutritional quality of pat choi. The study was conducted spanning two trials period of six weeks. Pat choi yield and plant tissue concentrations of N, P, K, Cu and Zn were determined per trial. Trial affected all crop variables except tissue P and Cu, for which the data across trials were pooled. N source affected all plant variables. The strength of this influence was modified when combined with either trial or soil. Crop dry matter (DM) significantly increased from the 1st to the 2nd trial for agouti manure and fertilizer, whilst a decrease was noted for the control and cow manure (CM). CM resulted in the highest yield in trial 1, but application of inorganic fertilizer showed the highest yield when repeated. Pat choi DM was significantly lower in the loam soil compared to the contrasting soils. Incorporation of AM resulted in greater tissue concentrations of the macro-nutrients (N, P, K) relative to other sources. Notably this difference was greater in the second trial. Tissue concentration of the heavy metals Cu and Zn were below acceptable levels across all treatments. Similarly AM produced plants with the highest concentration, but this effect varied with soil. Lower concentrations were reported in the clay soil for pots treated with AM and CM compared to inorganic fertiliser. AM is suited for use as an organic soil amendment.

16:34&14&15:2

Title: **DENSIDAD POBLACIONAL DEL JAGUARETE (*Panthera onca*) Y SU RELACIÓN CON EL PUMA (*Puma concolor*), EN LA RESERVA NATURAL PRIVADA MOROMBI, DEPARTAMENTO CAAZAPÁ Y CANINDEYÚ, PARAGUAY**
[POPULATION DENSITY IN THE JAGUARETE (*Panthera onca*) AND ITS RELATIONSHIP WITH THE PUMA (*Puma concolor*), IN THE RESERVA NATURAL PRIVADA MOROMBÍ, CAAZAPÁ DEPARTMENT AND CANINDEYÚ, PARAGUAY]

Author(s): Rosalia Fariña, Andrea Weiler
Email:
Country: Paraguay

Abstract:
El estudio realizado ha sido uno de los primeros en el Bosque Atlántico del Alto Paraná (BAAPA) paraguayo en la búsqueda de obtener un valor de densidad de la población de jaguares (Panthera onca) en una propiedad que conjuga la producción con la conservación, así como conocer más sobre la forma en que dicha especie, cohabita con el puma (Puma concolor), y con las especies presa, en un area fragmentada, rodeado de paisajes transformados y con tantas presiones. Se utilizaron estaciones

con cámaras trampa, que permitieron identificar un total de 7 individuos diferentes en 4 periodos de análisis entre 2008 y 2011, con una densidad estimada de 05-3 individuos/100 km2. Un Total de 40 especies fueron registradas, 27 mamíferos,12 aves y un reptil, de las cuales, al menos 16 pueden ser consideradas species presa, tanto del jaguar como del puma, sin que se haya registrado indicios de alguna relación entre la abundancia de los depredadores y las presas. La relevancia ecológica de los valores de depredadores y presas encontrados es resaltante a la vez que preocupante por el aislamiento en el que se desarrollan y que hace pensar en futuros problemas para su permanencia en el tiempo

The study has been one of the first in the Atlantic Forest of the Alto Paraná (BAAPA) in Paraguay in the search to obtain a value of density of the population of jaguars (Panthera onca) in a property that combines the production with the conservation% 2C as well as learn more about the way in which that species% 2C cohabits with the puma (Puma concolor) % 2C and with prey species% 2C in a fragmented area% 2C surrounded by landscapes and processed with so many pressures. Stations were used with camera trap% 2C which allowed us to identify a total of 7 different individuals in 4 periods of analysis between 2008 and 2011 % 2C with an estimated density of 05-3 individuals% 2F100 km2. A total of 40 species were recorded% 2C 27 mammals% 2C12 birds, a reptile% 2C of which% 2C at least 16 species can be considered prey% 2C, both of the jaguar and puma% 2C without which it is registered indications of some relationship between the abundance of predators and prey. The ecological significance of the values of predators and prey found is striking at the same time worrying that by the isolation in which they develop and what makes us think in future problems for their stay in time..

16:34&14&15:3

TITLE: **LAS AVES DE LA CIUDAD DE MÉXICO: UN DIFÍCIL PROBLEMA DE CONSERVACIÓN**

AUTHOR(S): Alejandro Meléndez-Herrada
Email: meha1789@correo.xoc.uam.mx
Country: Mexico

2:1&3:7

Title: **LAS AVES DE LA CIUDAD DE MÉXICO: UN DIFÍCIL PROBLEMA DE CONSERVACIÓN**

[THE BIRDS OF MEXICO CITY A DIFFICULT PROBLEM IN CONSERVATION]

Author(s): Alejandro Meléndez-Herrada

Abstract:

Spanish

La Ciudad de México tiene su origen en el gran lago donde se asentó la cultura Azteca. Ubicada en la convergencia de las regiones biogeográficas neotropical y neártica, han quedado relictos del lago y zonas montañosas de alrededor, con cierta representatividad de las condiciones ambientales originales. El Distrito Federal (DF) es la capital de México, donde se encuentran representados los principales hábitats para las aves silvestres de la región. El monitoreo de las aves por más de 30 años con observación y captura, en ambientes lacustres y montanos, ha permitido delimitar la problemática de su conservación. Aún con un fuerte estrés ecológico, se

han registrado 355 especies de aves, que representan el 33.4% de las especies de México pero en el 0.01% de su territorio nacional. En la zona urbanizada, las áreas verdes son insuficientes tanto para la gente como para las aves. Sin embargo, hacia el sur de la ciudad, se encuentra el denominado oficialmente “suelo de conservación”. En los humedales se han registrado al menos 212 especies de aves, donde 89 (25%) son acuáticas y dependen estrictamente de este hábitat. En los pisos altitudinales, los bosques están formados principalmente por árboles de los géneros Quercus, Pinus y Abies, y que con sus áreas modificadas ofrecen hábitats a 264 (74.3%) especies potenciales, formando comunidades avifaunísticas variadas. A la avifauna nativa, cada año se integran especies migratorias provenientes de Norteamérica, las que modifican temporalmente la estructura de las comunidades de aves. Muchas de estas aves continúan sus migraciones a países de la región neotropical y a su regreso deben encontrar los recursos necesarios para llegar a sus áreas de reproducción. Tres especies exóticas (Columba livia, Sturnus vulgaris, Passer domesticus), compiten con las especies nativas. Una cuarta más, la cotorra argentina (Myiopsita monahcus), recientemente se ha estado distribuyendo con rapidez en la Ciudad de México, sin medidas de control o erradicación. A los humedales de la Ciudad de México se les suministra agua de calidad baja, insuficiente e irregular por lo que se encuentra en riesgo ese hábitat para las aves. Así mismo, existe una controversia en la conservación de las aves acuáticas ya que los peces nativos fueron prácticamente extirpados por la introducción de especies exóticas (tilapias y carpas) y el mal manejo del agua, ocasionando la casi extinción del ajolote mexicano (Ambystoma mexicanum). Los esfuerzos de recuperación de esta especie de anfibio incluyen la erradicación de los peces introducidos, pero si no se recuperan los nativos, entonces las aves piscívoras disminuirán drásticamente. En los bosques la situación también es precaria debido a la tala, incendios, lluvia ácida y plagas de los árboles, a esto se añade el constante avance de la urbanización que resta espacio natural para las aves. La conservación de la vida silvestre de la Ciudad de México es compleja de llevar a cabo, a pesar de que son múltiples las leyes que la protegen, ya que intervienen fuertes intereses económicos, políticos y sociales. También, se hace necesaria una campaña amplia, permanente y efectiva de educación ambiental.

ENGLISH

Mexico City has its origin in the great lake where they settled the Aztec culture. Located at the convergence of biogeographical regions nearctic and neotropical% 2C have been relicts of the lake and mountain areas around% 2C with some representation of the original environmental conditions. The Federal District (DF) is the capital of Mexico, where are represented the main habitats for wild birds of the region. The bird monitoring for more than 30 years with observation and capture, in lacustrine environments and montane, has enabled us to define the problem of its conservation. Even with a strong ecological stress, have been recorded 355 species of birds, which represent 33.4 % of the species in Mexico but in the 0.01 per cent of its national territory. In the urbanized área, the green areas are insufficient to both people and birds. However, to the south of the city is the so-called officially "soil conservation". In the wetlands have been recorded at least 212 species of

birds% 2C where 89 (25 %) are aquatic and strictly depend on this habitat. In the altitudinal floors, the forests consist mainly of trees of the genera Quercus and Pinus abies and that with their modified areas offer habitats for 264 (74.3 %) potential species forming communities varied avifauna listings. To the native avifauna each year are integrated migratory species from North America, the that temporarily changed the structure of the bird communities. Many of these birds are continuing their migration to countries in the neotropics and on his return should find the necessary resources to reach their breeding areas. Three alien species (Columba livia, Sturnus vulgaris, Passer domesticus) compete with native species. A fourth more the parrot argentina (Myiopsita monahcus) has been recently been distributing quickly in Mexico City without measures to control or eradication. The wetlands of the Mexico City they were supplied with water from low quality, insufficient and irregular for what is found in risk that habitat for birds. Well same there is a dispute in the conservation of the aquatic birds as the native fish were almost extirpated by the introduction of exotic species (tilapia and carp) and the evil water management causing the near extinction of the Mexican axolotl (Ambystoma mexicanum). The recovery efforts of this amphibian species include the eradication of introduced fish, but if you do not recover the native, then the birds eating dramatically decrease. In the forests the situation also is precarious due to logging fires, acid rain and pests of trees has been added to this the constant advance of urbanization that subtracts natural space for the birds. The conservation of wildlife in the City of Mexico is complex to carry out in spite of the fact that there are many laws that protect already involved strong economic interests, political and social. Also there is a need for a comprehensive campaign, permanent and effective environmental education.

16:34&14&15:4

Title: **CERTIFICACIÓN DE LA TORTUGA TARICAYA (*Podocnemis unifilis*) EN LA RESERVA NACIONAL PACAYA-SAMIRIA: UNA ESTRATEGIA DE MANEJO COMUNAL DE FAUNA SILVESTRE [TURTLE CERTIFICATION IN THE PACAYA- SAMIRIA NATIONAL RESERVE: A STRATEGY OF COMMUNITY-BASED WILDLIFE MANAGEMENT]**

Author(s): Tula Fang
Email:
Country: Peru

Abstract:

Spanish

Un programa de manejo y conservación de la tortuga Taricaya (*Podocnemis unifilis*) está funcionando actualmente en la Reserva Nacional Pacaya Samiria (Perú) bajo la gestión de la Reserva. Desde hace varios años, los grupos de manejo locales comenzaron a obtener beneficios económicos del programa a través de la venta de las crías para el comercio de mascotas. La tortuga taricaya es parte de la gran demanda de carne de animales silvestres en el mercado local y regional y los huevos de taricaya son muy cotizados en el mercado, y se utilizan tradicionalmente en las comunidades locales y los asentamientos urbanos. Es por esto que este proyecto trabaja con varias comunidades locales y grupos de manejo de la Reserva Nacional Pacaya Samiria, en el noreste de la Amazonía Peruana. El proyecto piloto certificación de taricayas busca consolidar el programa de las crías de taricayas existente en la Reserva, usando como mecanismos el comercio local, regional e internacional de crías de taricayas vivas que son destinadas a la exportación especialmente al continente asiático. Desde hace algunos años China está trabajando con la crianza de taricayas en cautiverio, con taricayas provenientes del programa de conservación de taricayas de los grupos de manejo de la Reserva Nacional Pacaya Samiria. De acuerdo a algunas investigaciones, en China esta crianza en cautiverio está en una fase avanzada, y a algunos ejemplares les falta poco para alcanzar la edad reproductora. Es por esto que el proyecto está trabajando con las comunidades locales y los grupos de manejo de la reserva para ayudarles a que manejen la recolección de huevos de tortuga y la venta de las crías de la reserva como mascotas, a través de la certificación, de un proceso que certifica aquellas comunidades y grupos de manejo que implementen actividades de conservación en la reserva y que cumplen con los estándares de certificación. Por lo tanto, el proyecto piloto de certificación de taricayas actuaría como un mecanismo para agregar valor a las crías de taricayas vivas provenientes de la reserva utilizando incentivos económicos para el uso sostenible de la fauna.

English

A program of management and conservation of the turtle Taricaya (*Podocnemis unifilis*) is currently operating in the Pacaya Samiria National Reserve (Peru) under the management of the Reserve. For several years local management groups began to obtain financial benefits from the headstarting program through the sale of new born turtles into the pet trade. The turtle taricaya is part of the high demand for bushmeat in local and regional market and taricaya eggs are highly prized in the market, and are traditionally used in local communities and urban settlements. That is

why this project works with several local communities and management groups of the the Pacaya Samiria National Reserve in the northeast of the Peruvian Amazon. The turtle certification pilot project seeks to consolidate existing taricayas conservation in the Reserve, using as a mechanisms the local, regional and international trade of newborn turtles that are exported as pets to Asia. In recent years China is working with captive breeding of taricayas, from the turtle conservation program of the management groups of the Pacaya Samiria National Reserve. According to some research, in China this captive breeding is at an advanced stage, and the taricayas may be at reproductive age. This is why the project is working with local communities and management groups of reserve to help them manage the collection of turtle eggs and the live newborn turtles sold as pets through the certification of a process that certifies those communities and management groups to implement conservation activities in the reserve and meet certification standards. Therefore, the turtle certification pilot project will act as a mechanism to add value to live taricayas from the reserve using economic incentives for sustainable use of wildlife.

C. Wildlife Conservation Laws and Policy

16. History, Policy and Legislation

2:16:1
Title: **WILDLIFE VENEZUELAN LEGISLATION AND ITS SOCIAL IMPACT**
Author(s): Augusto Bravo
Country: Venezuela

2:16:2
Title: **A PRELIMINARY ANALYSIS OF THE WILDLIFE EXPORT TRADE IN GUYANA**
Author(s): Raihaana Ali
Email: raihaana.ali@uog.edu.gy
Country: Guyana
Abstract:

Guyana, located in South America, is blessed with a wealth of biological diversity. It is bordered by Suriname to the east, Venezuela to the north-west, and Brazil to the south and south-west, and covers an area of approximately 215,000 km2. Seventy-five percent of Guyana is forested lands, which supports diverse populations of flora and fauna. Such diversity fuels the wildlife trade industry; estimated at US$ 38 million in 2002 (Mangal, 2003). The Guyana Wildlife Management Authority (GWMA) issues permits for all species that are exported; including the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES) listed species. This paper reviewed the wildlife export trade information from the GWMA between 2003 and 2007; and focused specifically on the CITES listed species.

GWA has national quotas with regard to all species traded and exported. The purpose, source and destination of the exported wildlife is included in the permit information. Analysis of the trade and wildlife data indicated that the top CITES listed taxonomic groups in order of importance are the

birds (153), mammals (46), reptile (25), invertebrates (21), fish (8) and amphibians (7). The most popular CITES traded species in Guyana between 2003 and 2007 were the South American Spectacled Caiman (Caiman crocodilus crocodilus), Amazon Tree Boa (Corallus hortulanus), and Orange Winged Parrot (Amazona amazonica). These three species all had a cumulative export total of over 10000 species during the study period. The South American Spectacled Caiman export data was divided into skins and live specimens, totaling 29610 and 13779 each respectively, within the five years of the study. It is important to note that this represented a total of 43389 specimens valued over 130000 USD (3 USD for each specimen).

Despite the profitability of the wildlife trade; the continuous removal of these wildlife species in such quantities from their natural habitat is not a sustainable way to maintain their populations. Wildlife populations that are reduced beyond their ability to recover will negatively impact Guyana's wildlife trade industry. Captive breeding (or wildlife farming), if well managed could allow for the continued abundance of our wildlife populations whilst continuing to support the Guyana export trade. The high demand for many CITES listed species, for example, the South American Spectacled Caiman is a prime example of a species that could be captively bred. It is hoped that the Government of Guyana (GoG) will support this pathway towards sustainability of our wildlife species. Such GoG support (financial and otherwise) along with the proper resources and capacity building, should encourage possible entrepreneurs to view wildlife farming as a feasible commercial venture. If wildlife farming of selected species is proven feasible, it could reduce wild stock depletion, provide for exporters and still allow adequate compensation for all involved.

2:16:3

Title: **WILD LIFE LAWS IN THE REPUBLIC OF TRINIDAD AND TOBAGO: ARE THEY PROMOTING SUSTAINABLE NEO-TROPICAL ANIMAL DEVELOPMENT?**

Author(s): C. W. Rackal and M. D. Singh
Email: .....
Country: T&T

Abstract:

In 1934**,** the first Wild Animal and Bird Protection Ordinance, Chapter 25, No. 7 was established in Trinidad and Tobago; this was preceded by Conservation of Wildlife Ordinance, No. 16 of 1958 and was proclaimed in 1963. Wildlife conservation and utilization within the Republic of Trinidad and Tobago is attained primarily through the Conservation of Wildlife Act, Ch 67:01. Its basis lies in the regulation of game species using a permit system, gaming seasons and wildlife sanctuaries. It makes provision for penalties and fines by imprisonment for hunting in sanctuaries without licenses, for hunting protected animals, and for taking weapons and dogs into game sanctuaries. Section 3 of the Conservation of Wildlife Act provides for the establishment of thirteen (13) Wildlife Sanctuaries in Trinidad and Tobago, in which it is illegal to hunt. As a further measure to protect wildlife, Section 7 (1) of the Act prohibits hunting during the closed season, which extends from March 1 to September 30 of a calendar year. The Act, in addition, makes provision for the appointment of Game Wardens and Honorary Game Wardens, who are given *inter alia* the powers of search, seizure and the power to arrest without a warrant. The term

"Wildlife" refers to species of flora and fauna, however, the "Conservation of Wildlife Act" lack of specificity in this regard hence it is often misconstrued. Trinidad and Tobago has, over the years adopted two approaches to wildlife management: the first deals with the protection of individual species and populations; and the second, with the protection of habitats in which the species live. Inherent to these two approaches are the legal protection for the specie: management plans for their protection and ex-situ conservation. With a fifty-eight year old legislation in place, there is an urgent need to update the legislation to reflect current trends in the changing terminologies appropriate with the specific location of Trinidad and Tobago in relation to the countries, which share its animal biodiversity: the Neotropics. The Government has recognized this and has issued a Draft Forestry, Protected Areas and Wildlife Conservation Bill 2013, which proposes to repeal three Acts (Conservation of Wildlife Act, Forest Act and Sawmills Act) and make amendments to six (6) other Acts. Whilst this Bill has made significant improvements towards the conservation, production and utilization of Neo-tropical animals; it however contains clauses which may be ambiguous and raise questions to the sustainability and use of Neo-tropical Animals through the legislation. As such, Trinidad and Tobago laws on "wildlife" are limited in scope for the sustainable use of Neotropical animals for conservation, production and utilization and this may lead to mismanagement of indigenous fauna.

D. *Ex situ* Conservation and Domestication

17. Neo-tropical Animal Production

9:17:1

Title: **TOWARDS THE DEVELOPMENT OF AN INTENSIVE PRODUCTION MODEL FOR THE OPOSSUM (*Didelphis marsupialis*)**

Author(s): Laura Tardieu and Gary Wayne Garcia
Email: l_tardieu@hotmail.com
Country: T&T

Abstract:

In the Caribbean region the demand for animal protein particularly wild meat is on the rise. To reduce pressure on wild populations, there is a need for semi intensive systems to be developed for the rearing of neo-tropical, non-domestic species. *Didelphis* species possess unique physiological and anatomical adaptations that have allowed them to occupy extensive geographical ranges and to thrive in a variety of habitats. Combined with a high reproductive capability, wide omnivorous diet and a sturdy constitution, the local opossum (*Didelphis marsupialis*) is a perfect candidate for semi intensive rearing in the Caribbean. Development of animal production models requires information on the breeding and feeding of the species of interest. The objective of this paper is to present - from the available research- the information available on the digestive and reproductive systems of the opossum. Based on a literature review that included over 170 references spanning a 172 year period from 1841 to 2013, this paper will further highlight gaps and areas for future research on *D. marsupialis*.

9:17:2
Title: **ESTUDIO DE LA EDAD DE EMPADRE DE CUYES HEMBRAS *Cavia porcellus* DE UNA LINEA SINTÉTICA Y SU EFECTO SOBRE SU FERTILIDAD, TAMAÑO Y PESO DE CAMADA AL NACIMIENTO**
Author(s): *L. Chauca F.; M. Huaman A.; J. Muscari G.; R. Higaonna O.*
Email:
Country: PERÚ
Abstract:

9:17:3
Title: **INTERACCIONES COMPETITIVAS INTRAESPECÍFICAS, EN EL INCREMENTO DE MASA CORPORAL Y CONSUMO DE ALIMENTO EN SURI (*Pterocnemia pennata*)**
[COMPETITIVE INTERACTIONS INTRAESPECÍFICAS, IN THE INCREASE IN BODY MASS AND FOOD CONSUMPTION IN SURI (*Pterocnemia pennata*)]
Author(s): Huanca P. E and Pérez L. M.
Email: zamirha3@hotmail.com, miltonrpl@yahoo.com
Country:
Abstract:
Spanish
El presente estudio fue realizado, en la Universidad Técnica de Oruro, departamento de Oruro. Tiene el objeto de estudiar la interacciones competitivas intraespecíficas en el incremento de masa corporal y consumo de alimento de *Pterocnemia pennata* en cautiverio, con fines de manejo en Centro de Conservación, para lo cual se evaluó el incremento de masa corporal (10 meses) y el consumo de alimento (12 meses), tomando en cuenta 9 unidades experimentales (suris), tanto juveniles y adultos (macho y hembra). Teniendo como resultados un comportamiento No Normal, tanto en el incremento de masa corporal y consumo de alimento. En el incremento de masa corporal tomando en cuenta el tiempo de estudio (10 meses) y evaluando cada suri como unidad experimental. Se evidencio que existe diferencia en cada Suri de estudio con respecto al incremento de masa ($F_{1.596;11.170}$ = 15,284; p = 0,001), no influyendo significativamente el sexo ($F_{1.596;11.170}$ = 1,155; p = 0,337). En cuanto al consumo de alimento en los doce meses de estudio, el comportamiento es diferente por separado, mostrando una distribución bimodal diferenciada anual. Se puede concluir que los suris en estudio No muestran adaptación en los primeros 7 meses, pero en los últimos 4 a 5 meses tiene un comportamiento que se acerca a una distribución Normal, por lo cual existe la posibilidad de adaptación. Cabe aclarar el aspecto de la infraestructura y aéreas de esparcimiento limitados en los primeros meses de estudio y que fueron mejorados y ampliados en los últimos meses, pudieron influir en la adaptación de los suris. Por último es conveniente señalar que el presente estudio se enfoca en el incremento de masa corporal y consumo de alimento como respuesta al comportamiento grupal y viendo la tendencia de su posible adaptación. Sin embargo existe otros factores que influyen al comportamiento de los suris, los cuáles se recomienda realizar estudios posteriores, para tener datos referenciales y emitir un criterio para realizar conclusiones que puedan apuntar al manejo de *Pterocenmia pennata* en Centros de Conservación.

English
The present study was carried out% 2C at the Technical University of Oruro% 2C department of Oruro. Has the purpose of studying the intraspecific competitive interactions in the increase in body mass and food consumption of Pterocnemia pennata in captivity% 2C for the purposes of handling in Conservation Center% 2C for which assessed the increase in body mass (10 months) and the food consumption (12 months) % 2C taking into account 9 experimental units (suris) % 2C both juveniles and adults (male and female). Taking results as a normal behavior not% 2C in both the increase in body mass and consumption of food. In the increase in body mass taking into account the time of study (10 months) and evaluating each suri as the experimental unit. It was evident that there is difference in each Suri of study with respect to the increase in mass (F1.596 % 3B11.170 15 % 3D % 2C284 % 3B p 0 % 3D % 2C001) % 2C did not influence significantly the sex (F1.596 % 3B11.170 1 % 3D % 2C155 % 3B p 0 % 3D % 2C337). In regard to the consumption of food in the twelve months of study% 2C the behavior is different separately% 2C, showing a bimodal distribution annual differentiated. It can be concluded that the suris in study did not demonstrate adaptation in the first 7 months% 2C but in the last 4 to 5 months is a behavior that is closer to a Normal distribution% 2C for which there is the possibility of adaptation. It is important to clarify the aspect of the infrastructure and air of leisure limited in the first few months of study and that were enhanced and expanded over the past few months% 2C were able to influence the adaptation of suris. Finally it should be noted that the present study focuses on the increase in body mass and consumption of food as a response to the group behavior and looking at the trend of its possible adaptation. However, there are other factors that influence the behavior of the suris% 2C which is recommended to perform subsequent studies% 2C to have reference data and issue a criterion to make conclusions which can point to the handling of Pterocenmia pennata in conservation centers.

9:17:4

Title: **NUTRITIONAL FACTORS AFFECTING DIGSTIBILITY OF FIBER-RICH FEEDSTUFFS BY COLLARED PECCARIES (*Pecari tajacu*)**

Author(s): Sérgio Nogueira-Filho, Karen Martins, Alcester Mendes
Email: slgnogue@uesc.br
Country: Brazil

Abstract:

The peccary's (*Pecari tajacu*) fore-stomach allows the use of fiber-rich feedstuffs such as agricultural by-products. There is no consensus, however, on the ability of this species to effectively take advantage of these dietary fiber feedstuffs. In this context, the aim of this study was to determine the nutritional factors that can affect the digestibility coefficients of fibrous foods by peccaries, and evaluate the effects of different proportions of gross energy (GE), crude protein (CP), neutral detergent fiber (NDF), and acid detergent fiber (ADF) levels on the digestibility coefficients of nutrients and energy. There were provided four types of diets with 8% to 10% CP, 16.1 to 19.7 MJ/kg, 25.0 to 67.3% NDF, and 11.3 to 44.5% ADF. Using the 4 x 4 Latin square experimental design, each diet was offered during 10 adaptation days followed by five consecutive days of feces collection. The peccaries showed NDF and ADF digestibility coefficients means of 80.2±8.7% and 61.1±21.6%, respectively. Such levels are similar to the ones observed in wild and domestic truly ruminants confirming the ability of peccaries to digest fiber. Levels of 98% of roughage feedstuffs with almost 70% NDF and 45% ADF, however, decreased the feed intake and the energy apparent digestibility coefficients. Elevated levels of high-fiber feedstuffs, therefore, can result in a digestible energy intake bellow the peccary's requirements decreasing their performance. It is possible, however, to include high levels of fiber-rich agricultural by-products in the collared peccary's diet by including energetic feedstuffs, such as the palm kernel cake together with others that increase the food intake, such as the cassava hulls.

9:17:5

Title: **NITROGEN REQUIREMENT TO COLLARED PECCARY (ARTIODACTYLA, *TAYASSUIDAE*) IN CAPTIVITY**

Author(s): Rogério Martins Borges, Alcester Mendes, Sérgio Luiz Gama Nogueira-Filho
Email: **rogermborges@yahoo.com.br**
Country: Brazil

Abstract:

A study was conducted to determine the protein requirement of the collared peccary (Pecari tajacu) performing a nitrogen (N) balance digestion trial. In a 4 x 4 Latin square design, four adult captive male peccaries were fed four isoenergetic diets containing four different levels of N (13.3, 19.2, 28.7 and 37.1 g N/kg dry matter). After 15 days of adaptation, the total collection of feces and urine was carried out for five consecutive days. By regression analysis between N intake and N in feces and urine, the metabolic fecal nitrogen (MFN = 2.3 g/kg of dry matter intake) and daily endogenous urinary N (EUN = 146.7 mg/kg0.75) were determined. Likewise, by regression analyses between consumption of nitrogen and the nitrogen balance [NB=Nconsumed–(fecal N+Urine N)] we estimated the daily requirement of 475.1 mgN/kg0.75. Therefore, if food intake is unrestricted, collared peccaries require a minimum to 58.9 g of crude

protein/kg dry matter. These values are similar to those found in ruminants, which reinforces the proposition that peccaries have a digestive physiology nearer to that of ruminants than of pigs.

9:17:6

Title: **PROTEIN REQUIREMENT OF FINISHING PACAS (*Cuniculus paca*)**

Author(s): Ivanise da Hora Bastos; Alcester Mendes; Sérgio Luiz Gama Nogueira Filho
Email: **alcester1969@hotmail.com**
Country: Brazil

Abstract:

The paca (Cuniculus paca) yields the most appreciated meat among the Brazilian wildlife, which However, due to its characteristics, such as solitary behavior, frugivorous feeding habits, low reproductive rates and low slaughter weight, the captive breeding results in low income. One way to decrease the production costs is to determine their nutritional requirements, allowing formulation of cheaper balanced diets. There is no information on the paca's nutritional requirements. Due this, the paca's farmers formulate diets using domestic rabbit's nutritional requirements. This approach, however, probably causes unbalanced nutrition and increment in the production costs. Thus, this study aimed to determine the protein requirements of finishing pacas. Through a 4 x 4 Latin square design, four males pacas, aging 6 months and weighing 4.7 ± 0.7 kg were placed in metabolic cages and received four isoenergetic treatments (13 MJ/kg of digestible energy) containing four different nitrogen levels (11.3; 16.6; 21.4; 26.6 g N/kg of dry mater-DM). After 15 days of adaptation, feces and urine samples were collected during five consecutive days, to determine the apparent digestibility of DM, N, and gross energy. By the regression analysis between the total N intake and digestible N was estimated the metabolic fecal nitrogen (MFN = 4.2 g/kg of DM intake). The linear regression between N intake and N content in urine allowed to estimated the endogenous urinary nitrogen (EUN = 91.6 mg/kg0.75/ day). Likewise, by regression analyses between consumption of nitrogen and the nitrogen balance (NB = N consumed– (fecal N + Urine N) the requirement of 280.5 mg N/kg0.75/day was estimated. Therefore, if food intake is unrestricted, minimum requirement of finishing pacas is 55.0 g/kg of crude protein of a diet with 13 MJ/kg of digestible energy. This value represents almost 40% of the protein requirements of growing rabbits. The use of paca's specific diet, thus, could decrease its total production costs.

9:17:7

Title: **NUTRIENT ANALYSES AND CERTAIN BLOOD NUTRITIONAL INDICES ASSOCIATED WITH FOOD SOURCES FED TO A COLONY OF THE RED RUMP AGOUTI (*Dasyprocta leporina*)**

Author(s): Aphzal Mohammed, Andell Edwards, Puran Bridgemohan, Janine Seetahal, Neemdass Chandool, Garvin Perry
Email: aphzal.mohammed@utt.edu.tt
Country: T&T

Abstract:

In Trinidad, where the farming of the agouti, *Dasyprocta leporina* occurs, the development of a feeding regime identified by nutrient and certain biochemical indices is important for implementing the proper management of the species. This study involved a preliminary investigation of food sources of the agouti *Dasyprocta leporina*, in association with certain plasma blood metabolites. Two composite feed samples one from a mixture of food ingredients, and another from a rabbit feed ration were collected and nutrient contents analysed by proximate analysis. The food mixture fed to the agouti consisted of mixture of *Syzygium malaccense*, *Manihot esculenta*, *Musa* spp. *Cocos nucifera*, *Hymenaea corbaril*, *Carapa guianesis*, and *Inga edulis*. Blood samples (n= 13) were drawn from 9 open females, 2 pregnant females and two male agouti. Blood was drawn by venipuncture from the right lateral saphenous vein and collected in heparinized tubes for analyses of Plasma b hydroxyrate, cholesterol, protein and electrolytes Na, K and Cl concentrations (mmol/L)

The crude Protein (CP); Ether Extract (EE); and crude fibre (CF) of the concentrate and mixed feed diets were 19 and 8.5%; 2.6 and 22.5%; and 9 and 14% respectively. The concentrate rabbit feed had the capacity to meet the crude protein (CP) requirements of the agouti (CP 19%) based on the needs of a growing rabbit. The EE findings suggest that the agouti was being fed a diet high in energy. The apparently low CF fibre levels found may have positively influenced feed intake.

Mean±SD (n=13) of blood metabolites (mmol/L) plasma hydroxybutyrate was 0.07 ± 0.03; cholesterol 4.38 ± 1.25; sodium 101. 46 ± 58.13; Potassium 7.66± 4.34; and chlorine was 77.23±35.02, respectively. The mean ± SD for plasma protein concentration (g/L) was 88.5 ± 3.61. Increased ME intakes are required in late pregnancy in cattle and multiple bearing pregnant ewes, is positively related to plasma hydroxybutyrate concentrations. The low concentrations found in this study may be indicative of the low ME requirements for mainly open female agouti. The plasma cholesterol levels found were higher than those found in food animals and are associated with the fibre content of the diet. Plasma Na and chloride electrolyte concentrations were lower while K concentrations were higher than those found in food animals. Plasma protein concentrations were high when compared with that of the group, *Dasyprocta* spp. .

Title: **EVALUACIÓN ZOOTÉCNICA DE LA RATA SEMIESPINOSA (PROECHIMYS SEMISPINOSUS) COMO ALTERNATIVA DE SEGURIDAD Y SOBERANÍA ALIMENTARIA EN EL LITORAL PACÍFICO COLOMBIANO**
[EVALUATION UTILIZATION OF RAT spiny (Proechimys semispinosus) ALTERNATIVE SECURITY AND FOOD SOVEREIGNTY IN COLOMBIAN PACIFIC COAST]

Authors: **Aguilera, A. & S. Muñoz.**
Email: aaguileraa@unal.edu.co
Country: Colombia

Abstract:

La pesca es el principal medio de sustento para muchas de las comunidades asentadas en el litoral del Pacífico colombiano, pues de allí no solo deriva la principal fuente de ingresos económicos sino también su demanda alimentaria, siendo una fuente de ración proteínica importante (>85%); sin embargo, practicas inadecuadas en la pesca están generando un impacto considerable en las poblaciones marinas y aún más en los pobladores que dependen de ella. Una alternativa a esta problemática es el establecimiento de una veda además de otras estrategias que ayudan a mitigar el impacto de la sobrepesca en la región; no obstante, esta situación supone una dificultad para los pescadores y sus familias pues hay una disminución considerable tanto de ingresos como de fuentes alimenticias, lo que conlleva a que se adopten otras dietas y métodos para la consecución de alimento, una de ella es la caza de especies nativas terrestres conocidas en el medio local como “carne de monte” en su mayoría pequeños mamíferos que son capturados en trampas artesanales y que aportan a los requerimientos nutricionales de las familias de la región; sin embargo se observa que los diversos mamíferos adquiridos escasean en número y en tamaño con el pasar del tiempo y el esfuerzo de captura debe ser cada vez mayor. Entre los pequeños mamíferos consumidos se encuentra el ratón de campo o rata semiespinosa de Tomes (Proechimys semispinosus) el cual se distribuye en los bosques tropicales de América; éste es consumido por las comunidades afrodescendientes e indígenas residentes a lo largo del Pacífico colombiano quienes aprecian su exquisita carne. Se realizó una caracterización del tracto Gastro Intestinal (TGI) del echymido para una aproximación a los requerimientos nutricionales, resultando ser un buen fermentador al presentar un ciego gástrico del 25% del peso húmedo del TGI, pudiendo ofrecer una ración alterna para su crianza al no entrar a competir de forma directa con la dieta humana. De igual manera, se evaluó la interacción de 20 individuos en 5 grupos relación 3:1, se obtuvieron 19 individuos en 8 partos determinando diferentes parámetros reproductivos en cautividad de P. semispinosus; se destaca la posición testicular interna en la zona media ventral del cuerpo. Con una ración (10% peso vivo jaula) conformada por sobras de cocina, productos locales de temporada y complementada con 3% de fibra (Arachis pintoi) la tasa de conversión alimentaria (CA) del individuo varió entre 2,2 y 3 g, los primeros 60 días de vida; mostrándose como una especie promisoria para aportar a la seguridad y soberanía alimentaria del Pacífico colombiano, siendo necesario la tecnificación de estos zoocriaderos no convencionales para su potencialización y posible utilización en las zonas rurales del litoral vallecaucano como alternativa durante la temporada de veda contribuyendo a mejorar la calidad de vida de los pescadores y sus familias.

Fishing is the main livelihood for many of the communities along the coast of the Colombian Pacific , for there not only derives the main source of income but also the food demand , being a source of protein ration significant (> 85 %) ; however, inadequate fishing practices are generating a considerable impact on marine populations and even more in the people who depend on it . An alternative to this problem is the establishment of a ban as well as other strategies that help mitigate the impact of overfishing in the region; however, this situation poses a difficulty for fishermen and their families as there is a considerable decrease both income and food sources , leading to other diets and methods for achieving food is taken, one of them is hunting terrestrial native species known in the local media as " bushmeat " mostly small mammals that are caught and made traps contributing to the nutritional needs of families in the region; however is observed that the various mammals acquired scarce in number and size with the passage of time and the effort to capture must be increasing. Among small mammals consumed is the spiny field mouse or rat Tomes (Proechimys semispinosus) which is distributed in tropical forests of America; it is consumed by black communities and indigenous residents along the Colombian Pacific who appreciate its exquisite meat. Characterization Gastro Intestinal Tract (GIT) of echymido for an approach to the nutritional requirements was carried out to be a good fermenter to submit a blind gastric 25% of wet weight of the GIT may offer an alternative ration for breeding by not to compete directly with the human diet. Similarly, the interaction of 20 individuals in 5 groups evaluated 3:1 , 19 individuals were obtained from 8 different reproduction parameters determining delivery captive semispinosus P. ; testicular inner position in the middle ventral body stands . With a serving (10% body weight cage) composed of kitchen scraps , seasonal local produce and complemented with 3 % fiber (Arachis pintoi) the feed conversion ratio (CA) of individuals ranged from 2.2 to 3 g, the first 60 days of life ; appearing as a promising species to contribute to food security and sovereignty of the Colombian Pacific , the automation of these unconventional zoocriaderos for potentiation and possible use in rural areas of coastline vallecaucano alternatively be needed during the closed season helping to improve quality of life of fishermen and their families.

18. Role of Zoos and Zoological Societies

9:18&24:1
Title: **HISTORY OF LIVE ANIMAL COLLECTIONS IN TRINIDAD AND TOBAGO**
Author(s): Jalaludin Khan
Country: Trinidad and Tobago

9:18&24:2
Title: **THE EMPEROR VALLEY ZOO, PORT OF SPAIN TRINIDAD, TRINIDAD AND TOBAGO**
Author(s): Guptie Lutchmidial and Nadra Nathi-Gyan
Country: Trinidad and Tobago

9:18&24:3
Title: **A PRIVATE ZOO INTEGRATED WITH DOMESTIC SMALL RUMINANT PRODUCTION**
Author(s): Lincoln Thackorie and John Borely
Country: Trinidad and Tobago

9:18&24:4
Title: **RESPONSIBLE TOURISM FOR REAL**
Authors: Kevon Wilson
Email: kwilson@tourism-intelligence.com
Country: T&T
Abstract:
This presentation is based on Tourism Intelligence International newly published, easy-to-read, thoroughly-researched and highly-informative report entitled, "Responsible Tourism for Real". There is a paradigm shift taking place in travel and tourism. This paradigm shift, driven by a number of global developments – particularly the increasing deterioration of the environment and growing threats of environmental disasters; growing demands by increasing mature and informed consumers for more responsible products and services; as well as key positive actions undertaken by governments and businesses – suggest that Responsible Tourism is not a luxury item, but a growing necessity for the travel and tourism industry. At the same time, there is a growing body of knowledge and experiences regarding the implementation and best practices of Responsible Tourism. But how can tourism be developed in a sustainable and responsible manner? What can we learn from the successes and failures others? In this presentation Tourism Intelligence International will draw on the real experiences of companies and countries all over the world that are practicing responsible tourism – those that have done it right from the start such as Costa Rica and the Commonwealth of the Dominica and the challenges that they continue to face; those that were forced by their circumstances to develop responsible tourism (South Africa); and those that have destroyed and have now rescued their natural and cultural resources such the Rhine River in Germany. We are confident that this presentation will to be an eye-opener for all those interested in growing and developing tourism in a responsible manner.

9:18&24:5
Title:
Author(s): Wild Fowl Trust
Country: Trinidad and Tobago

9:18&24:6
Title: Las Hermanas Eco-Resort
Author(s): Wayne Hutchinson
Country: Trinidad and Tobago

9:18&24:7
Title:
Author(s): Nature Seekers
Country: Trinidad and Tobago

9:18&24:8
Title:
Author(s): Turtle Trust
Country: Trinidad and Tobago

9:18&24:9
Title:
Author(s): Toco Foundation
Country: Trinidad and Tobago

E. Finance and Economics of Neo-tropical Animals

19. The Finance and Economics of Neo-tropical Animal Production

16:19:2
Title: **ASSESSING THE INFORMATION NEEDS OF NEOTROPICAL FARMERS IN TRINIDAD AND TOBAGO SUBMISSION**
Author(s): Felix N., M. D. Singh, G. W. Garcia and G. Seepersad
Email: nkosif@gmail.com
Country: T&T
Abstract:
The information needs of farmers have increased in importance with the demand for food production worldwide. Agricultural Information can be important for the sustainability of farm production, as it aims to provide knowledge in techniques, input supplies and extension assistance. Information of the market including trends, buyers and existing prices would provide farmers with the ability to increase competition and market penetration. Given these facts and the need to increase the food and nutritional security of Trinidad and Tobago, it is important that information improve the feasibility of neotropical animal farms. The provision of information would lead to neotropical animal farmers increasing their competitiveness and as a result their sustainability since they will be aware of prices, trends and other relevant information with respect to their stock.This paper investigates the information needs of these farmers in Trinidad and Tobago, to identify what information they

consider most important. The Likert scale was employed to achieve this objective by rating the importance of various types of information. Point Score Analysis was used to rank the factors which were identified as important among wildlife farmers. The study highlighted the importance of information to these farmers to increase their operative competence and economic feasibility therefore improving their sustainability.

16:19:3

Title: **A BUSINESS PLAN FOR THE PRODUCTION OF A POPULAR LOCAL WILDLIFE SPECIES:THE AGOUTI (DASYPROCTA LEPORINA)**

Author(s): Mohan Manick, Haven Allahar, Gary Garcia
Country: T&T

16:19:4

Title: **USING THE TIME VALUE OF MONEY TO ASSESS THE FEASIBILITY OF INVESTING INTO AGOUTI UNIT SUBMISSION**

Author(s): Felix N., M. D. Singh, G. W. Garcia and G. Seepersad
Email: nkosif@gmail.com
Country: T&T

Abstract:

Agouti (Dasyprocta leporina) is farmed by over 70% of all the registered wildlife farms in Trinidad and Tobago, as this neotropical animal is highly prized for its meat. This paper seeks to assess the feasibility of agouti (Dasyprocta leporina) production units in Trinidad and Tobago, given the restriction on sale in the previously closed hunting season of 2012/2013 and the present two year ban effective from 1st October 2013 to 2015. In Trinidad and Tobago prior to the two year ban on hunting, farmers were only allowed the sale of carcasses during the months of October, November, December, January, February and March. This was done to ensure that no illegal hunting or sale of game meat was conducted during the remaining seven months of the year. This therefore presented a model whereby no revenue could be generated during this time period. However, production costs would be incurred for feed and animal care. The Time-Value of money quantifies the future worth of a unit of currency spent today and therefore provides the needed return before entering an investment. Using the initial capital outlay and the monthly inflows along with the outflows of a series of units across Trinidad and Tobago an average was identified. The Net Present Valuewas then calculated using these averages discounting the monthly transactions. The findings of the study shows the need for policy to ensure these neotropical animal producers are viable since agouti is a source of indigenous protein with potential to contribute to Trinidad and Tobago's food security.

20. The Finance and Economics of Neo-tropical Animal Conservation

F. Health

21. Neo-tropical Animal Health under Intensive Systems of Animal Production

22. Interaction of Neo-tropical Animal Health, Domestic Animals and Human Health

23. Health and Quarantine Issues with respect to trade in Neo-tropical Animals

19:21&22&23:1

Title: **ISOLATION AND ANTIMICROBIAL RESISTANCE OF MICROORGANISMS IN THE WILD AMAZON REGION**

Author(s): Hilma Lúcia Tavares Dias, Natália Inagaki de Albuquerque, Roberto de Farias Espinheiro, Suely Regina Mogami Bomfim, Diva Anelie Guimarães, Otávio Mitio Ohashi
Email: hilmads@hotmail.com
Country: Brazil

Abstract:

Some enterobacteria are always associated with disease, while others are members of the normal microbiota and may cause opportunistic infections in wild animals. The aim of this study was to evaluate the frequency and antimicrobial resistance of enterobacterial various animal species in captivity in the state of Para 116 turtles, 84 birds, 20 nonhuman primates, 15 iguanas, 14 peccaries and eight manatees were analyzed. Samples were collected by the introduction of the cloaca swabs and anus according to the animal and sent to the laboratory of Biomolecular Technology, Federal University of Pará for conducting microbiological isolation and culture species. The samples were inoculated in BHI (Brain Heart Infusion) and isolated on MacConkey, blood agar and XLT agar after incubation at 37 °C for 24 hours. The main bacteria isolated according to the species of animals were *Klebsiella pneumoniae* (83.7%), *Enterobacter cloacae* (59.7%), *Serratia marcescens* (44.6%), *Salmonella* spp. (38.5 %), *Escherichia coli* (33%), *Proteus mirabilis* (24.6%) and *Citrobacter freundii* (13.7%) isolated from turtles, *Enterobacter* sp. (39%), *Shigella* sp. (19.4%), *Proteus* sp. (13.8%), *K. pneumoniae* and *Micrococcus* sp. (11%), *E.coli* and *Staphylococcus* sp. (2.7%) were obtained from birds. *E. coli* was present in 41%, followed by *K. pneumoniae* 28% in samples from non-human primates. *Salmonella* sp. (34.6%), *E. coli* (19.2%), *Proteus* sp. (15.3%) and *Klebsiella* sp. (3.8%) were the most common in iguanas and *E.coli* (68.7%), *Staphylococcus* sp. (19%) and *Streptococcus* sp. (12.5%), were isolated from

peccaries. Of samples from manatees were isolated *E. coli* (80%), *K. pneumoniae* (65.6%), *Bacillus* spp. (43%), coagulase-negative *Staphylococcus* (20%), *Proteus* sp. (15.7%), and *Streptococcus* spp. (3.7%). The level of antimicrobial resistance among bacteria was observed high resistance to two or more classes of antimicrobials such as amikacin, clindamycin, nalidixic acid, lincomycin, neomycin, tetracycline, and vancomycin. It follows a monitoring of captive related species should be performed infection by these bacteria isolated to prevent the spread of pathogens in the environment.

19:21&22&23:2

Title: **HAEMATOLOGICAL VALUES AND PLASMA PROTEIN CONCENTRATIONS OF A SEMI INTENSIVELY REARED COLONY OF THE RED RUMP AGOUTI [*Dasyprocta leporina*]**

Author(s): Aphzal Mohammed, Mervyn Campbell, Candace Sant, Puran Bridgemohan, Hasani Stewart, Rod Seapaul
Email: aphzal.mohammed@utt.edu.tt
Country: T&T

Abstract:

In Trinidad, where the farming of the specific species of the agouti, *Dasyprocta leporina* occurs, the development of standard reference blood values is important for the implementation of the proper health management of the species. Also a search of the literature reveals no such published data on this species. There is however, a paucity of information on the red and white blood cell values of the grouped agouti species (*Dasyprocta* sp.). This preliminary study represents an investigation into blood values and plasma protein concentrations of a colony (n=14) of agouti reared semi-intensively at the Eastern Caribbean Institute of Agriculture and Forestry, Trinidad. Blood was drawn by venipuncture from the right lateral saphenous vein and collected in potassium EDTA tubes for complete blood counts (CBC) . Haemoglobin concentration, packed cell volume (haematocrit), white blood cell count and differential leukocyte counts were carried out according to the established procedures (Schlam's Haematology, 2010). Mean ± SD values of haemoglobin (g/L); haematocrit (L/L); and mean corpuscular haemoglobin concentration (g/L) were 15.2± 2.04; 0.49± 0.06; 307± 19.7 respectively. Mean ± SD values (X 109/L) of total white blood cell count and of neutrophils; lymphocytes; eosinophils; monocytes and basophils were 5.0 ± 1.11;1.86 ± 0.55; 2.67 ± 0.87; 0.25± 0.31;0.15± 0.16;and 0.02 ± 0.04, respectively. Blood smears of 86% (12 of 14) of the animals in the colony contained a few irregular-shaped red blood cells. Also no blood parasites were detected. Red blood cell values were high when compared with that of the group *Dasyprocta* sp.. The white blood cell and neutrophil values were low when compared with those of *Dasyprocta* sp. The red cell abnormality observed may be indicative of Type C haemoglobin which may be characteristic of this particular species and representing a haemoglobin gene variant that is also found in certain breeds of cattle, camels, buffaloes and goats.

19:21&22&23:3

Title: **BACTERIA, FUNGI AND PARASITES FOUND ON NASAL CAVITY AND INTESTINAL MUCOSA OF FRESHLY SHOT WILD AGOUTI (*Dasyprocta leporina*) IN TRINIDAD**

Author(s): Rod Suepaul, Roxanne Charles & Francis Dziva
Email:
Country: T&T

Abstract:

The agouti (*Dasyprocta leporina*) is a new world rodent that is hunted for its delicious meat in the forests of Trinidad. Recent years have seen increased farming activities of this species to provide a ready and easy access to the meat. These have afforded an excellent opportunity for researchers to understand the reproductive physiology, anatomy, nutrition, health and welfare in order to improve agouti production under captive conditions. Whilst some data now exists on captive species, little is known on their wild counterparts still inhabiting the forests of Trinidad. Here, we describe microflora found on the nasal cavity and sections of the intestinal tract of freshly shot agouti. We also report on the prevalent parasites detected in the intestinal tract of these animals. The *Staphylococcus epidermidis* (11/13), *S. intermedius* (4/13), *Bacillus* spp (4/13), *Enterobacter* spp (3/13) and *Escherichia coli* (2/13) were the most common bacteria found on the mucosa of the nasal cavity. *Escherichia coli*, *Streptococcus viridans*, *Bacillus* spp, *Klebsiella pneumoniae* were predominant species in all sections the intestinal tract. The fungi; *Aspergillus fumigatus*, *Aspergillus* spp, *Candida* spp, *Penicillium* spp, *Mucor* spp were only isolated in the nasal cavity of one animal each but not in any section of the intestinal tract. The nematodes; *Strongyloides* spp, *Ascaridia* spp, a hookworm, whipworm, a trematode and *Trichuris* spp were detected at variable frequencies in each of the section of the intestines, whereas *Eimeria* spp were found in all sections. Since these were wild agoutis with no known clinical history, the implications of these findings were therefore not readily clear. Nevertheless, it should be stressed that all these organisms have the potential to cause opportunistic infections in immunocompromised hosts.

19:21&22&23:4

Title: **TRYPANOSOME INFECTION IN SLOTHS (*Choloepus hoffmanni*) AND (*Bradypus variegatus*) IN RURAL PANAMA**

Author(s): Nicole L. Gottdenker, Kadir Gonzalez, Vanessa Pineda, Ana María Santamaría, Diorene Smith, Milixa Perea , Chystrie Rigg, José E. Calzada, Azael Saldaña
Email: **gottdenk@uga.edu**
Country: USA & Panama

Abstract:

Previous studies have shown that two-toed and three-toed sloths, *Choloepus hoffmanni* and *Bradypus variegatus*, respectively, are significant sources of blood meals for *Rhodnius pallescens*, the principal vector of Chagas disease in landscapes surrounding the Panama Canal. Accordingly, the objective of this study was to evaluate the infection rates of *Trypanosoma cruzi* and *Trypanosoma rangeli* in two-toed and three-toed sloths in Panama. Fifty-nine sloths (N=13 *B. variegatus* and N= 46 *C. hoffmanni*) were captured in agricultural landscapes near three rural communities in the districts of Panamá and Capira. Sloths were

anesthetized and blood was taken for hematology, blood smears, trypanosome culture, and DNA extraction. Xenodiagnostics were also performed on most of the sloths using laboratory-raised *R. pallescens*. Duplex pcr was performed for *T. cruzi* and *T. rangeli*. Overall, 35.6%, (N=21) of sloths were pcr-positive for either *T. cruzi* and/or *T. rangeli. T. rangeli* was identified in most (95.2%, N=20/21) pcr-positive sloths, preliminary evidence of *T.rangeli-T.cruzi* coinfection was detected in two sloths, and single infection with *T. cruzi was* detected in one sloth. The proportion of *B. variegatus* pcr-positive for trypanosomes (69.2 %, N=9/13) was significantly greater than the proportion of *C. hoffmanni* (28.3%, N=13/46) that were positive for trypanosomes (p=0.01). Blood smears and cultures did not always correspond to pcr results, possibly because many animals may have also been infected with Endotrypanum sp. that were not targeted on pcr assays or culture. Results of culture and pcr results, animal signalment, xenodiagnostic assays, and hematology will be discussed in relation to the scientific literature and to the ecology of *T. cruzi* and *T. rangeli* in rural Panama.

19:21&22&23:5

Title: **FUNCTIONAL ANATOMY OF THE HIND LIMB SKELETON OF THE ORANGE RUMPED AGOUTI (*Dasyprocta leporina* LINNAEUS, 1758)**

Authors: Venkatesan Sundaram, Andrew Adogwa, Suresh Rao and Kathy-Ann Leon
Email: drvenkat1971@gmail.com
Country: Trinidad and Tobago

Abstract:
Dasyprocta leporina, a caviomorph rodent is on the verge of domestication in Trinidad and Tobago. Considering the domestication and great anatomical variations exhibited by the members of the order Caviomorpha, the anatomy of the hind limb skeleton is studied from a structural and functional perspective for the better understanding of this species. The study is carried out using 12 adult animals of both sexes. The results show that several features are indicative of emphasized parasagittal movements and stabilized joints. The well developed ischial tuber, the relatively long and strongly built with wide iliac wing and close grouping of greater and lesser trochanter near the proximal tuberosity of the femur imply that the animal possesses a relatively well developed flexor-extensor muscle set adapted to quick movements (reaction). The good jumping ability of *D. leporina* is strengthened by the rather elongated body of the calcaneus. These features along with elongation of the shank and foot indicate that *D. leporina* exhibits a well developed cursorial ability with high jumping potential.

G. Tourism

24. Tourism [Eco-tourism/Agro-tourism]

25. Management for the conservation of the wildlife communities

H. Education

26. Education and Communication for the management of Neo-tropical Animals

27. Neo-tropical Animal Education in the Primary School System

28. Neo-tropical Animal Education in the Secondary School System

29. University Programs on Neo-tropical Animals

Title: **(AGSC 4001)Neo-Tropical and Companion Animals-A means of enhancing student knowledge and promoting student interest in Neo tropical animal production and conservation in teacher training**

Author: Ramjattan V.; Davis F.; Hospedales R.; Mollineau W.; Perez L.; Dhanoolal K.; Walker J.
Email: vishal.ramjattan@gmail.com
Country: Trinidad and Tobago

Abstract

The potential for the course (AGSC 4001) Neo-Tropical and Companion Animals to contribute to a greater appreciation for Neo-tropical animal production and conservation in Trinidad and Tobago seems to be significant. This quantitative study was devised in order to determine whether exposure to AGSC 4001 increased student knowledge about Neo-Tropical animals. Fourteen (14) teacher trainees enrolled in the AGSC 4001 course were purposefully selected for this study. Prior to the commencement of the course, the teacher trainees' knowledge of Neo-Tropical animals was assessed. Results were assessed and subsequently compared to their results in the same evaluation instrument that was administered after the course was completed. The results indicated that generally teacher trainees' knowledge of the production and conservation of Neo-tropical animals improved significantly after exposure to the AGSC 4001 course. Future research is needed to understand what aspects of the AGSC 4001 can be enhanced in order to supplement teachers' cadre of approaches to bridging the gaps in students' knowledge of Neo-tropical animals in Trinidad and Tobago.

Title: **USING THE GUINEA PIG (CAVIA PORCELLUS) TO TEACH LIVESTOCK SCIENCE CONCEPTS ON THE CARIBBEAN SECONDARY EDUCATION CERTIFICATE (CSEC) AGRICULTURAL SCIENCE SYLLABUS (MAY/JUNE 2008) OF THE CARIBBEAN EXAMINATIONS COUNCIL (CXC)**

Authors: Hospedales R. *; Davis F.; Mollineau W.; Ramjattan V.; Garcia T.; Singh S.; Boodoo-Roberts J.; Garcia G
Email: ricardo.hospedales@utt.edu.tt
Country: T&T

Abstract:

The Caribbean Secondary Education Certificate Agricultural Science Syllabus of the Caribbean Examinations Council was designed for a wide range of students throughout the Caribbean. Agricultural Science is a multidisciplinary subject and an applied science with pillars in the basic sciences of Physics, Chemistry and Biology, Integrated science and Home Economics the social science of economics that focus on the factors of production, principles of business, entrepreneurship, social policy related to poverty alleviation; and cultural and religious expressions and the practical arts, technical skills and scientific knowledge involved in Crop and Animal Production. The Syllabus is divided into five sections, namely:

Section A- The Business of Farming
Section B- Crop Production
Section C- Animal Production
Section D- Horticulture
Section E- Animal Management.

The 'learning by doing' and integrated philosophy recommended for Section C has not resulted in the high level of mastery expected. The Chief Examiner's Report of the CSEC Agricultural Science Examination in 2010 indicated that the students' responses 'lacked scientific soundness' as they were unable to correctly define key animal concepts and terms. This comment was fleshed out in other reports from 2011-2013 that provided examples of this deficiency by students throughout the Caribbean. This observation was later correlated to the lack of livestock teaching resources in secondary schools. Seventy five schools presented candidates for CSEC Agricultural science in the Republic of Trinidad and Tobago in 2013. A national survey was conducted and 50 (66.6%) schools responded in February-March 2014. An analysis found that the issue raised by the Chief Examiner is exacerbated by the lack of financial and material resources that 65% reported are disbursed in an erratic manner. As a result further analysis indicated that 65% never rear rabbits, 57% of the schools do not rear layer birds and 6.2% do not rear broilers. 60% of schools reported that there was inadequate space on the farm to rear animals.

This survey recommends the use of the Neo-tropical Guinea pig as an alternative animal that can be successfully reared at the school farm as it can be linked to the available non-conventional feed resources. This animal has several characteristics that make it attractive to be reared on school farms. They are small and more animals can be reared in small spaces, they feed exclusively on forages as they are hind gut fermenters and do not need concentrate feeds and are thus cheaper to rear. They also reproduce rapidly and can be thus used effectively to teach concepts and principles of reproductive biology in the CSEC classroom. There is a ready market for the animal and thus can be linked to the business component of the CSEC syllabus.

I. Native Peoples and Neo-tropical Animals

30. Neo-tropical Animals and Native Peoples

31. Indigenous Knowledge of Neo-tropical Animals and Conservation

J. Hunting of Neo-tropical Animals

32. Sport Hunting

16:31&32:1

Title: **EIGHT CATEGORIES OF GAME ANIMALS IN TOBAGO: THE STATUS OF SOME SPECIES**

Author(s): William Trim
Email:
Country: T&T

Abstract:

Eight categories of Game permits were sold for eighteen wildlife open seasons from 1995/1996 to 2012/2013 in Tobago. And mandatory data forms (MDF) for the same period were returned and analyzed along with the Game permits. The average number of game permits purchased per season was 170 but the average number of data forms returned was 92. Most permits were purchased for hunting agouti (*Dasyprocta* spp.) and the least number for hunting Lappe (*Cuniculus paca*). However, Lappe and Red Brocket Deer (*Mazama americana*) are not found in the wild in Tobago. Derived from the MDF returned, the most captured game species was Dasyprocta spp. but the least captured species were water fowls (10). Though 33 MDF were returned for Collared peccary (Pecari tajacu), there were no records of peccary being caught in Tobago. Why these figures? The data collected showed that about 46 % of the MDF was not returned. Some MDF were incomplete. Based on illegal hunting reported to the Wildlife Section, and several related court matters, not every hunter bought game permits. Furthermore, informal interviews with hunters and forestry officers revealed: 1) Red Brocket Deer was exterminated in Tobago by early 1980s; 2) several species of cage birds are rare and extinct; 3) though Collared peccary is native to Tobago, it has been rarely encountered and may be the next large carnivore to become extinct; 4) the water fowls are hunted mainly with air rifles; 5) iguana and caiman are heavily hunted; 6) many nine-banded armadillos are hunted with cage traps; and 7) on the other hand, wild and feral agouti may be flourishing due to the species smallness and its ability to avoid being caught; its resilience after storms and hurricanes, the species wide variety of food (including food crops), and its high reproductive capability while farmed agouti may be experiencing in-breeding. Further studies are required for these species.

16:31&32:2

Title: **LA CACERÍA DEPORTIVA EN PARAGUAY, MECANISMO EFECTIVO DE CONSERVACIÓN???**

[SPORT IN PARAGUAY, IS IT AN EFFECTIVE MECHANISM FOR CONSERVATION?]

Author(s): Rosalia Fariña, Martha Motte, Carmen Vitale
Email: rosyfarina@rieder.net.py
marthamottep@gmail.com carmen_vitale@yahoo.com.mx
Country: Paraguay

Abstract:

La Secretaria del Ambiente, Autoridad que administra la vida silvestre en el Paraguay, fundamenta la Política Ambiental Nacional manifestando entre otras cosas que,: "el ambiente es un patrimonio común de la sociedad, y de su calidad dependen la vida y las posibilidades de desarrollo de las comunidades del Paraguay y que la sustentabilidad del desarrollo del país está fuertemente ligada a la utilización y al manejo adecuados de sus recursos naturales, a la producción sustentable, al mejoramiento de la calidad de vida de la población, al logro de la equidad y a la plena participación social en el desarrollo".

Entendiendo que dicha sustentabilidad y el manejo adecuados solo podrán darse en la medida en que todos los recursos naturales sean apreciados y valorados como proveedores de calidad de vida, la Secretaria del Ambiente asume su rol y pone a consideración de la sociedad un nuevo incentivo ambiental para la conservación de los recursos naturales a través de la valorización de las propiedades convertidas en Unidades de Manejo, donde, mediante estudios técnicos que determinen el estado de sus poblaciones de fauna silvestre, se pueda acceder a la habilitación de un porcentaje para su uso

Así, además de responder a los intereses manifiestos tanto de cazadores deportivos como de operadores turísticos, se presentan como objetivos específicos: motivar a los propietarios privados a diversificar su producción, promover la conservación del hábitat de las especies silvestres a través del uso sustentable a través de unidades de manejo y la cacería deportiva; producir información técnica sobre el estado de las especies de la fauna silvestre; valorizar económicamente el recurso fauna silvestre mediante el establecimiento de tasas; promover el turismo nacional e internacional; involucrar a las comunidades rurales en la producción de bienes y servicios para las unidades de manejo; acrecentar el conocimiento científico de las especies silvestres; involucrar a los gobiernos locales en las acciones de protección y control; desarrollar programas de educación ambiental en las zonas donde se encuentren las unidades de manejo donde se impartan las bases y fundamentos de la actividad, así como la importancia de la conservación de los recursos naturales, etc.

Este Programa prevé los mecanismos de control y monitoreo necesarios, incluyendo las especies y las temporadas a ser cazadas, los requerimientos de las Unidades de Manejo, las modalidades de caza, los aspectos administrativos y de educación ambiental. De esta manera, el Paraguay se une al grupo de países que identifican a la práctica de la cacería deportiva de especies de la fauna silvestre como el mecanismo correcto para ordenar, corregir rumbos y gestionar la vida silvestre del país con una visión de conservación y sustentabilidad

The Secretariat of the Environment% 2C Authority that manages the wildlife in the Paraguay% 2C founded the National Environmental Policy stating among other things that% 2C% 3A "environment is a common heritage of the society% 2C and its quality depends on the life and the possibilities for development of the communities of Paraguay and the sustainability of the development of the country is strongly linked to the use and proper management of their natural resources% 2C to the sustainable production% 2C to the improvement of the quality of life of the people% 2C to achieving equity and full participation in the social development".

Understanding that the sustainability and the proper handling may be issued only to the extent that all natural resources are appreciated and valued as providers of quality of life% 2C the Secretariat of the Environment assumes its role and put into the consideration of the society a new incentive for the environmental conservation of natural resources through the enhancement of the properties converted into Management Units where% 2C% 2C through technical studies that determine the status of their populations of wildlife% 2C can be accessed to the empowerment of a percentage for your use

as well% 2C in addition to responding to the manifests interests both sport hunters such as tour operators% 2C are presented as specific objectives% 3to motivate private owners To diversify its production% 2C promote the conservation of the habitat of the wild species through the sustainable use through management units and sport hunting% 3B producing technical information about the status of the species of wild fauna% 3B exploit economically the wildlife resource through the establishment of rates% 3B promote the national and international tourism% 3B involve rural communities in the production of goods and services for the management units% 3B increase the scientific knowledge of the wildlife% 3B to involve local governments on the actions of protection and control% 3B to develop environmental education programs in the areas where they are the management units where courses are the bases and foundations of the activity% 2C As well as the importance of the conservation of natural resources% 2C etc.

This program provides for the mechanisms of control and monitoring necessary% 2C including the species and the seasons to be hunted% 2C the requirements of the Management Units% 2C the hunting modalities% 2C the administrative aspects and environmental education. In this way% 2C the Paraguay joins the group of countries that identify to the practice of sport hunting of wildlife species such as the correct mechanism to sort% 2C correct directions and manage the country's wildlife with a vision of conservation and sustainability .

16:31&32:3

Title: **LA CAZA DE ANIMALES SILVESTRES POR CAMPESINOS DEL CHACO SECO DE LA PROVINCIA DE CÓRDOBA, (ARGENTINA).**

Author(s): TAMBURINI, Daniela María & CÁCERES Daniel Mario
Email: dtamburini@com.uncor.edu
Country: Argentina

Abstract:

Los campesinos del Chaco Seco cordobés son productores de subsistencia abocados principalmente a la ganadería extensiva de pequeña escala. Para muchos de ellos la caza de animales silvestres constituye una práctica cotidiana y, a pesar de estar prohibida, representa un complemento dietario importante. El área de estudio incluye la localidad de Chancaní y parajes rurales vecinos. El objetivo del trabajo es describir la caza de fauna silvestre y analizar las principales características y estrategias de los cazadores. Entre 2010 y 2012 se entrevistaron 40 campesinos y se realizaron 10 observaciones participantes. Se distinguen y caracterizan dos categorías de cazadores: frecuentes y esporádicos. Un reducido grupo de campesinos no consume carne silvestre por distintos motivos (condición de salud, edad o gusto por este tipo de carne). La caza persigue distintos fines (e.g., alimentación, defensa del ganado, etc.), y requiere atributos específicos (e.g., habilidad, buenos perros y equipo de caza). Conocimiento práctico, sagacidad y coraje otorgan al cazador reconocimiento social y constituye un símbolo de masculinidad. En los últimos años, los campesinos observan menor disponibilidad de especies valiosas, que asocian principalmente con caza indiscriminada, degradación del bosque nativo y cambio de uso de la tierra. Actualmente, los campesinos muestran algunas actitudes de protección hacia la fauna, así como la valoración no utilitaria de algunas especies (e.g., corzuela).

Farmers Chaco Seco Cordoba are mainly subsistence farmers doomed to small-scale ranching. For many of them the hunting of wild animals is a daily practice and, despite being prohibited, is an important dietary supplement. The study area includes the city and rural landscapes Chancaní neighbors. The objective of this paper is to describe the hunting of wildlife and analyze the main characteristics and strategies of hunters. Between 2010 and 2012, 40 farmers were interviewed participants and 10 observations were made. Characterize and distinguish two categories of hunters frequent and sporadic. A small group of farmers do not consume wild meat for various reasons (health status, age or taste for such meat). Hunt pursues different purposes (eg, food, defense of livestock, etc..), And requires specific attributes (eg, ability, good dogs and hunting gear). Practical knowledge, wisdom and courage give the hunter social recognition and is a symbol of masculinity. In recent years, farmers observed reduced availability of valuable species, mainly associated with indiscriminate hunting, degradation of native forests and changing land use. Currently, farmers show some attitudes towards wildlife protection and non-utilitarian value of some species (eg, corzuela).

16:31&32:5

Title: **HUNTING AND TRADE OF YELLOW-FOOTED TORTOISE (*Chelonoidis denticulata*) BY TRADITIONAL COMMUNITIES IN THE BRAZILIAN AMAZON**

Author(s): Thaís Queiroz Morcatty and João Valsecchi
Country: Brazil

Title: **[THE DIVERSITY AND HUNTING PRACTICED BY INDIGENOUS PEOPLES OF SOUTH AMERICA] LA DIVERSIDAD Y LA CACERÍA PRACTICADO POR PUEBLOS INDÍGENAS DE SUR AMÉRICA**

Authors: Wendy Townsend
Email: wendytownsend@gmail.com
Country: Bolivia

Abstract:

Spanish

Muchos de los Pueblos Indígenas de América Latina son cazadores para su subsistencia, y por supuesto sufren de los impactos directos cuando hay cambios del uso de suelo. Varios autores han demostrado que la cacería cambia en calidad y cantidad según las condiciones de las zonas de caza. En esta presentación se resume información sobre la cacería practicada por 15 Pueblos Indígenas en la Amazonia, para describir este fenómeno más al fondo. Se pone en la mira las diferencias y similitudes en la composición cualitativa y proporcional entre las especies capturadas por los diferentes cazadores estudiados. Se aplicó varios índices de riqueza y diversidad para poder distinguir diferencias, jerarquizarlas y atribuir dichas divergencias a las a condiciones ambientales. Se incluye en la discusión las creencias culturales que puedan impactar el uso de especies específicas o grupos de ellos. Se discute la utilidad de las listas de cacería como un aporte al desarrollo de una índice de la calidad del ambiente, útil para documentar daños que surgen ser pocos visibles.

English

Many of the Indigenous Peoples of Latin America are hunters for subsistence, and of course suffer from the direct impacts when there are changes in land use. Several authors have demonstrated that changes in hunting quality and quantity according to the conditions of the hunting areas. Information on hunting practiced by 15 Indigenous Peoples of the Amazon, to describe this phenomenon further background is summarized in this presentation. Is placed on looking at differences and similarities in the qualitative and proportional composition between different species taken by hunters studied. Several indices of richness and diversity was applied to distinguish differences, rank them and attributed these differences to environmental conditions. Included in the discussion of cultural beliefs that may impact the use of specific species or groups of them. Utility lists hunting as a contribution to the development of an index of the quality of the environment useful for documenting damages arising be few visible is discussed.

33. Hunting for Scientific Purposes

16:33:1

Title: **THE HUNTING OF PACA (*Cuniculus paca*) AND ITS SUSTAINABILITY IN THE BRAZILIAN AMAZON**

Author(s): Hani Rocha El Bizri and João Valsecchi and José Eugênio Cortes Figueira
Email: joao.valsecchi@mamiraua.org.br email about authorship?
Country: Brazil

Abstract:

Ungulates, large primates and caviomorf rodents are cited by Neotropical hunters as preferred species. Paca (*Cuniculus paca*) is amongst the most consumed wild species in the Neotropics. The paca is a nocturnal caviomorf rodent which inhabits the Central and South Americas and Mexico. The consumption of pacas is so intense that it is comparable to that of domestic animals in some rural areas in the Amazon. The species has been extinct owing to disorderly hunting and habitat destruction in many forest remnants, and it is classified as locally threatened in several states in Brazil. In this research, we aimed to describe paca hunting in the Brazilian Amazon, to investigate the sustainability of this activity and to assess the potential of a hunting practice for monitoring pacas in Amazonia. The project was conducted in the Amanã Sustainable Development Reserve (ASDR), Brazil. Paca hunting was monitored in five rural communities during eight years. Local collectors were trained for registering biological information on the specimens killed and data on hunting events. We used the Spearman coefficient to assess a possible relation between the number of specimens killed and water level and to test the relation between the number of pacas killed and lunar illumination level. We also performed an analysis of sustainability of paca hunting in the ASDR. For this purpose, we calculated a capture-per-unit-effort index (kg/hunter*hour) and assessed its fluctuation along the years of monitoring.

Furthermore, we evaluated the potential of the traditional hunting method called “spotlighting” for monitoring paca population in the ASDR. We opened four trails on the black-water flooded forest, and traveled these trails at night in order to record pacas.

The killing of 625 pacas was registered by local collectors. Paca hunting took place mainly at night (63%) and the most commonly method used was “spotlighting” (52%). We found a positive correlation between the number of pacas killed and water level ($r_s=0.890$; $p<0.0001$). At least 37% of the pacas were hunted when moon illumination level was less than 10%, before moonrise or after moonset. In the Boa Esperança community, capture of paca tended to decrease at nights with high moon illumination ($r_s=-0.663$, $p=0.067$). At the same time, we observed an expressive catch-per-unit-effort decrease in this community ($r_s=-0.881$, $p<0.001$), allowing us to predict unsustainable hunting levels for the next decade. During the nocturnal transects, we registered 44 pacas with a effort of 152.5km of trails traveled, and the number of individuals recorded was significantly less on bright nights (t-value=-4.01; df=55.1; $p<0.001$).

The stock of pacas in the ASDR could be continuously replaced if surrounding areas consisted of continuous forests. However, permanent hunting and deforestation force local hunters to travel longer distances to kill prey such as pacas. The confirmation of the relation between paca habits and lunar illumination, a pattern described by local hunters, as well as the “spotlighting” method effectiveness, demonstrates the

possibility of integrating traditional knowledge to scientific knowledge. This integration might be useful to produce relevant conservation strategies for several hunted species in the Brazilian Amazon.

16:33:2

Title: **HUNTING EFFECTS ON WHITE-LIPPED PECCARY (*Tayassu pecari*) EMOTIONAL STATES**

Author(s): Selene Nogueira
Email: seleneuesc@gmail.com
Country: Brazil

Abstract:

White-lipped peccary (WLP-Tayassu pecari) are over-hunted in Neotropical forests, and categorized as a vulnerable-species. Stressful events such as hunting may impact on individual decision-making behavior in the wild, which may in turn influence survival chances. We used a judgment-bias experiment to investigate whether simulated consequences of hunting (trapping and handling) affected decision-making under ambiguity. Eight WLP were previously trained to 'go' to a baited food bowl when a positive auditory cue (whistle; CS+) was given and to 'no-go' when a negative cue (horn; CS-) was sounded indicating an empty food bowl. A different 'ambiguous' auditory cue (bell; CSA) was presented to probe decision-making under ambiguity. Individuals were subjected to three tests in the order: T1 (control-no trap), T2 (24hs after trap procedure), and T3 (control-no trap). In T2 we trapped the animals in a corral-trap using a chute and a restraining-cage for individual capture and handling, respectively. During each of the three tests (T1,T2,T3), each animal was exposed to 30 judgment bias trials (10 of each of the three cue types: CS+,CS-,CSA). We recorded whether animals reached the food bowl within 60s ('go' response) and their response speed (m/s). There was an interaction ($F_{4, 36}=2.91$, $P=0.03$) between tests (T1,T2,T3), cue type (CS+,CS-,CSA), and animal sex (male, female). The post hoc tests revealed that peccaries clearly discriminated ($Ps<0.0002$) the CS+ (0.92±0.12) and CS- (0.18±0.12) cues in all tests. The WLPs varied, however, in their responses to CSA cue depending on the test type and animal sex. During the first control test (T1), the females showed higher ($P=0.0003$) proportions of 'go' responses to CSA (0.70±0.14) than for CS- (0.25±0.13); while males did not show differences ($Ps>0.05$) between CSA (0.20±0.11) and CS- (0.25±0.10). In T2, both males and females showed similar proportion ($Ps > 0.88$) of 'go' responses made to CSA (0.24±0.16) and CS- (0.11±0.12). During the second control tests (T3) the means proportions of 'go' responses of males and females did not difffer ($Ps>0.05$) and were higher ($Ps<0.0006$) to CSA (0.62±0.14) than to CS- (0.21±0.10). Moreover, there was an interaction between animal sex and cue type in their reponse speed ($F_{2, 36}=5.06$, $P=0.01$): females were faster ($P=0.046$) to respond to CSA (0.15±0.13m/s) than to the CS- (0.04±0.02m/s). Our results showed that trapping, capture, and handling simulationg a hunting event may cause a 'pessimistic' judgment bias in white-lipped peccaries, which may reflect a negative affective state, and also function to increase caution following the event. This study starts an important examination of the survival strategies of this species, and reports effects on affect-induced cognitive bias that may have implication for survival.

16:33:3

Title: **DO LOCAL AO LEGAL: INTERAÇÕES ENTRE SISTEMAS INSTITUCIONAIS DA CAÇA NA RDS PIAGAÇU-PURUS, AM, BRASIL. [FROM LOCAL TO COOL: INTERACTIONS BETWEEN INSTITUTIONAL SYSTEMS OF HUNTING IN PIAGAÇU-PURUS RDS, AM, BRAZIL.]**

Author(s): Marina A. R. M. Vieira, Fábio de Castro and Glenn H. Shepard
Email: **maaavieira@yahoo.com.br**
Country: Brazil

Abstract:

A fauna no Brasil é considerada bem de uso comum da população, cuja proteção é responsabilidade do Estado. Embora a legislação seja tolerante com relação ao abate de fauna para "saciar a fome" (Lei Federal nº 9605 de 1988), não existem regulamentações formais específicas sobre a caça. Esta lacuna, na prática, leva à ausência de diretrizes para distinguir caça ilegal e legal por parte de órgãos fiscalizadores e à ausência de garantia do direito de uso da fauna por parte das populações que dependem da caça para sua segurança alimentar. Informalmente, sistemas de controle de uso da fauna compartilhados por usuários locais podem representar medidas eficientes para prevenir impactos decorrentes da caça. Através do Sistema de Unidades de Conservação (UC's) de Uso Sustentável é possível a incorporação do sistema local de regulamentações no sistema formal de gestão territorial, uma vez que o ordenamento do uso dos recursos é construído de maneira participativa com os moradores. Nosso objetivo neste trabalho é avaliar a correspondência de conceitos entre mecanismos formais e informais da caça e demonstrar quais são as contradições e onde há possibilidades de interação entre os diferentes níveis regulatórios para a gestão da fauna na RDS Piagaçu-Purus (RDS-PP). A RDS-PP, criada em 2003 pelo governo do estado do Amazonas, é localizada no Baixo Rio Purus, onde 4000 moradores compartilham o uso de recursos em 835 mil ha. O estudo foi desenvolvido em 5 comunidades de Terra Firme, onde a caça é mais expressiva. Entre 2012 e 2013, analisamos o conteúdo das regras formais disponíveis (Constituição Federal, Lei de Proteção à Fauna, Lei de Crimes Ambientais, duas leis que regulamentam as áreas protegidas, Plano de Gestão da RDS-PP e ata de reunião de comunidade); realizamos entrevistas semi-estruturadas com os principais caçadores de cada comunidade (n=62; 60% do total de chefes de família) para descrever o sistema local de regras; realizamos entrevistas estruturadas fechadas sobre conceitos formais e informais; e fizemos análise de consenso cognitivo sobre os conceitos formais e informais entre moradores (n=71) e representantes do Conselho Gestor (CG) da UC (n=27) utilizando o software Anthropac 4.98. Encontramos um rico universo normativo regulando a caça, que incluem regras pessoais, normas culturais, acordos compartilhados entre parceiros de caça e regras compartilhadas no nível da comunidade (formalizadas em ata em um caso). Particularmente com relação à comercialização dentro da comunidade e ao transporte de caça, existem pontos de discordância entre moradores e CG que explicitam a necessidade por uma melhor delimitação sobre caça ilegal no Brasil. Apesar deste ponto de discordância, verificamos que há consenso entre moradores e representantes do CG sobre as regras formais e informais, facilitando o entendimento-comum para elaboração do Plano de Gestão condizente à realidade local. Na prática, o Plano de Gestão representa o único mecanismo com suporte legal para ordenar o uso de fauna. Assim, no Plano de Gestão deve-se buscar incorporar as regulamentações locais

evidenciando como o sistema institucional que envolve a caça também faz parte do modo de vida das populações que dela dependem.

The fauna in Brazil is considered common use of the population , whose protection is the responsibility of the State . Although the legislation is tolerant with respect to the killing of wildlife for " feeding the hungry " (Federal Law No. 9605 of 1988) , there are no specific formal regulations on hunting . This gap , in practice, leads to the absence of guidelines for distinguishing legal and illegal hunting by regulatory agencies and the lack of guarantee of the right of use of wildlife by the populations that depend on hunting for their food security . Informally , control use of local shared by users fauna systems may represent effective measures to prevent impacts of hunting. Through the System of Conservation Units (CUs) for sustainable use is possible the incorporation of the local system of regulations in the formal land management system , since the spatial use of resources is constructed in a participatory way with the locals. Our goal in this work is to evaluate the matching concepts between formal and informal mechanisms of hunting and demonstrate what are the contradictions and where there are opportunities for interaction between different regulatory levels for wildlife management in Piagaçu - Purus RDS (RDS - PP) . The RDS - PP , established in 2003 by the government of Amazonas state , is located in the Lower Rio Purus , where 4000 residents shared use of resources 835 000 ha . The study was conducted in 5 communities of Upland , where hunting is more expressive . Between 2012 and 2013 , we analyzed the content of formal rules available (Federal Constitution , Law of Wildlife Protection , Environmental Crimes Act , two laws governing protected areas management plan RDS - PP and minutes of the meeting of community) ; conducted semi - structured interviews with key hunters in each community (n = 62 , 60 % of heads of households) to describe the local system of rules ; closed on structured interviews conducted formal and informal concepts ; and made analysis of cognitive consensus on the formal and informal concepts among residents (n = 71) and representatives of the Managing Council (GC) of UC (n = 27) using the software Anthropac 4.98 . We found a rich normative universe regulating hunting , including personal rules , cultural norms , shared agreements between hunting partners and shared at the community level rules (formalized in minutes in one case) . Particularly regarding the marketing within the community and the transport of hunting, there are points of disagreement between residents and CG explicit the need for a better definition of poaching in Brazil . Although this point of disagreement , we find that there is consensus among residents and representatives of the CG on the formal and informal rules , facilitating the understanding commonplace for preparation of the Management Plan consistent with local reality . In practice , the Management Plan is the only mechanism with legal support to order the use of fauna. Thus , the Management Plan should seek to incorporate local regulations showing how institutional system involving hunting is also part of the lifestyle of the people who depend on it .

K. Cuisine

34. Neo-tropical Plant and Animal Cuisine

L. Neo-tropical Animal Art

35. Art and Neo-tropical Animals

M. Conservation of Neo-tropical Animals: The Special Case of the Caribbean Small Island States

36. Issues of Small Island States

MINI-CURSOS/MINI-COURSES

1] Intensive Production of the Agouti [*Dasyprocta leporina*]
Presenters: Mrs. Michele Singh, [B.Sc. Agric. General UWI and Ph.D. Candidate] [T&T] and Dr. William Mollineau [B.Sc. Agric. General UWI; M.Sc. Tropical Animal Science and Production (TAS&P) UWI and Ph.D. Livestock Science, UWI] [T&T]

2] Intensive Production of the Collared Peccary [*Tayassu tajuca/Pecari tajuca*]
Presenter: Ms. Gail G. Young [B.Sc. Agric. General UWI, MSc. Agricultural Development, Guadeloupe, M.Sc. Rural Development The Hague and Ph.D. Candidate] [T&T]

3] Intensive Production of the Capybara (*Hydrochoerus hydrochaeris*)
Presenter: Sérgio Luiz Gama Nogueira-Filho, [B. Sc. Agricuoture, M.Sc. Animal Science, Ph.D. Animal Behaviour, University of Sao Paulo] [Brazil], Full Professor of Wildlife, Neo-tropical Animal Nutrition Laboratory, Department of Agricultural and Environmental Science
Universidade Estadual de Santa Cruz, Ilheus, Bahia [Brazil]

4] Intensive Production of the White Tailed Deer [*Mazama americana*]
Presenter: Prof. Jose Mauricio Barbanti Durate, DVM [Brazil]

5] Intensive Production of the Cocrico [*Ortalis ruficauda*]
Presenter: Mr Romano A. Mac farlane [B.Sc. U of Winnipeg; B.Sc. Agribusiness Management, UWI; M.Sc. TAS&P UWI] [T&T]

6] What do we know about the Manicou [*Didelphis marsupialis*] with the intention for Intensive production?
Presenter: Ms. Laura Tardieu [B.Sc. U of Western Ontario; M.Sc. Wildlife Management and Health, U of Sydney, Ph.D. Livestock Science Candidate, UWI] [T&T]

7] Intensive Production of Guinea Pigs (*Cavia porcellus*): The Peruvian Experience with the Guinea Pig Industry
Presenter: Ing. Lilian Chauca Franca [The World Expert on Guinea Pigs] [Peru]

8] Creating a Sustainable Relationship between Humans and Snakes in Trinidad and Tobago
Presenter: Retired Trinidad and Tobago Army Staff Sargent Anthony Z. Garcia [T&T]

9] Care and Management of Neo-tropical Non-human primates in captivity

Presenter: Dr. Hugo Galvez [DVM, U. of San Marcos; M.Sc. in Ecology and Sustainable Development, National University of the Peruvian Amazon] , Ass**.** Prof. in Veterinary Medicine, National University of San Marcos; Head, Centre for Reproduction and Conservation of Non-Human Primates, Iquitos [Peru]

10] Animal behaviour of Neo-tropical animals in Captivity

Presenter: Prof. Selene Nogueira, [Ph.D. in Animal Behaviour U. Of Sao Paulo] [Brazil], Professor of Animal Behaviour
Department of Biological Science
Universidade Estadual de Santa Cruz, Ilheus, Bahia [Brazil]

11] Nutrition of Neo-tropical animals in Captivity

Presenter: Prof. Alcester Mendez, Ph.D.
Prof. in Animal Nutrition, Neo-tropical Animal Nutrition Laboratory, Department of Agricultural and Environmental Science, Universidade Estadual de Santa Cruz, Ilheus, Bahia [Brazil]

12] Nine Banded Armadillo [***Dasypus novemcinctus***]

Presenter: Prof. Jim Loughry, [B.Sc. Biology U of Pitts., Ph.D. Animal Behaviour, U of Calif.], Professor of Biology, Department of Biology, Valdosta State University, [USA]

13] Added Value of Neo-tropical animals

Presenter: Ing. Gustavo Porini
Direccion de Fauna Silvestre
Secetaria de Ambiente y Dessarollo Sostenible de la Nacion, San Matin, Buenos Aires [Argentina]

14] Management and Production of stingless bees

Presenters: Louis Farrell [ECIAF Dip. in Agric., B.Sc. General Agric. UWI, M.Sc. TAS&P, UWU], Gladstone Solomon [President of the Tobago Bee Keepers Association], David Rostant [T&T]

ROUND TABLE/MESA REDONDA #1- COMFAUNA PRESENT SITUATION

Chair: Ing. Tula Fang
Rapporteur: Dr. Michael Valqui
Participants:

- FUNDAMAZOINIA
- Prof. Pedro Mayor Aparicio
- Ing. Kymberlyn Chota
- Dr. Pablo Puertas
- Dr. William Bodmer
- Dr. Dr. Richard Bodmer
- All mambers of COMFAUNA

MESA REDONDA/ROUND TABLE #2
ICT and Neo-tropical Animal Extension

Chair: Dr. David Dolly [Concept Note]
Rapporteur: Dr. Greason
Department of Chemistry
Faculty of Science and Technology
UWI

- **Dr Alexi Danchev**
- **Dr. Alexander Nikov**
- **Mr. Gerry Mac farlane**
- **Miss Stacey Syne**
- **Miss Wilhelmina Kissoonsingh**

Title: **A SYSTEM OF MOBILIZING INDIGENOUS KNOWLEDGE [IK] IN NEO-TROPICAL ANIMALS [WILDLIFE/NON-DOMESTIC ANIMALS] USING COMMUNICATION WITH INFORMATION COMMUNICATION TECHNOLOGIES [ICTS] WITHIN THE CARIBBEAN AND LATIN AMERICAN REGION**

Authors: **Wilhelmina Kissoonsingh**
Email:
Country: T&T

Abstract:
Neo-Tropical Animal Farming has been widely accepted as a viable source of food. These produces have produced animals mostly on tried and through practice and indigenous knowledge. In Trinidad and the wider neo-tropics producers are faced with a number of problems that include but which are not limited to: (1) Lack of information, including production and marketing information, (2) little or no Government or Institutional Support and (3) a Shortage or Breeding Animals. There is great amount of sharing of research, ideas and activities at the CIMFAUNA Conference which has taken place every 2 years for the last 22 years and there is the potential for farmer to farmer sharing of information and farmer to institution sharing of information. *How, therefore, can one best get meaningful advice to farmers and create learning environments that help achieve the desired outcomes and results for the continued production and improvement of Neo-tropical Animals?* This is the question that shall be

addressed. A possible solution will be to **create a Regional Network of Researchers and Farmers through the use of sentinel sights and Information Communication Technologies (ICTs) for the purpose of sharing Indigenous Knowledge in order to improve the, conservation, production, and utilization (CPU) of Neo-Tropical Animal Species.** This will Increase South-South Collaboration with researchers and producers leading to the sharing of information for the development of Neo-Tropical Animal Wildlife Production Systems.

Title: **ELEARNING BASED EDUCATION IN NEO-TROPICAL ANIMAL PRODUCTION**

Authors: Stacey Syne, Alexander Nikov, Gary Garcia, Michele Singh
Email: staceysyne@gmail.com
Country: T&T

Abstract:

During the past 2 decades, there has been a shift in the mode of education from the restrictive lecture hall type of teaching to the digital environment. The internet, webpages, software, and technologies like the smart phone are all tools which enable this rapidly increasing trend of eLearning. MIT, for example embarked on a mission to make academic material from all its courses available on the web free of charge in 2001. During the past two decades, there has been a shift in the mode of education from the restrictive lecture hall type of teaching to the digital environment. The internet, webpages, software, and technologies like the smart phone are all tools which enable this rapidly increasing trend of eLearning. MIT, for example embarked on a mission to make academic material from all its courses available on the web free of charge in 2001. Reasons for this trend in popularity are its practicality, portability, flexibility and affordability. If done correctly, eLearning results in efficient knowledge exchange and effective learning. When applied to the study of neo-tropical wildlife, this strategy confers significant advantages for increasing information exchange. This is a necessary component in the promotion and advancement of conservation strategies of these little known species.

eLearning can contribute towards improved wildlife farming, successful campaigns to stop illegal hunting, the dissemination of educational material for academic and research purposes, and the distribution of multi-media to increase awareness. Such activities can significantly increase the breeding stock, population numbers and genetic diversity of neo-tropical animals. There are different educational approaches: 1) self-paced asynchronous eLearning or instructor-led synchronous eLearning; 2) Linear or adaptive (personalized) eLearning; 3) Single or collaborative eLearning. eLearning supports these learning approaches and enables easy translation of techniques and procedures in the field with realistic portrayals of practical farming situations. Often, a text book alone would neither confer the knowledge and correct methodology for dealing with unpredictable animal behavior, nor impart recent advances in this

relatively neglected field of study. The most appropriate approaches depending on wildlife applications will be discussed.

Multi-media is used for presenting eLearning material like text, images, audio, video, and animation as well whiteboards, screencasting, blogging and webcams. eLearning benefits students with its multi-media nature where videos, animations, pictures, etc. can help to generate a better understanding into the reproduction, anatomy and behavior of neo-tropical species. eLearning is using technologies like CD-ROM, DVD, Internet TV, and computer-based learning, local intranet/extranet and web-based learning. The types of eLearning systems are stand-alone, based on local networks, based on Internet. What media, technologies and systems or combinations among them are most appropriate for wildlife eLearning will be discussed.

eLearning also connects experts in the field, inquisitive students, informative hunters, knowledgeable farmers and curious members of the general public. Features such as chat rooms, message boards, social media and web conferencing make it possible to join together individuals separated by oceans and borders for efficient knowledge exchange. Best practices vetted and lessons learnt experienced by experts in the field and other farmers can be communicated and applied to mould high-yield strategies for wildlife farmers. In so doing, eLearning can help them overcome challenges they face to education and efficient knowledge exchange, such as isolation in rural areas, long distances to universities and research centres, and the high cost of education.

How can be improved learner experience and performance in wildlife eLearning? How to study learner emotions and give recommendations for designing eLearning will be discussed.

There is enormous potential of eLearning to advance production techniques, improve farmers' standard of living, and enhance educational experiences for all concerned. This roundtable will discuss and explore ways in which this method of teaching and communication can help to improve neo-tropical animal production, and the possible challenges that may be endured. Future research directions if wildlife eLearning will be discussed.

ROUND TABLE/MESA REDONDA #3

Conservation of Animal Genetic Resources with particular reference to Small Island States [SIS]

Chairperson: FAO Representative
Rapporteur: Mr. Greg Rawlins
IICA Representative

Dr Michelle Mellows

Ag. Deputy Director Animal Production, Ministry of Food Production and Chair of the local FAO Animal Genetic Resources Programme

- Mr Romano Mac farlane
  Conservation Activist
- Mr. Gerry Mac farlane
  Director Bucco Reef Trust
- Wild Fowl Trust
- Asa Wright Nature Centre
- Turtle Trust
- Institute of Marine Affairs

ROUND TABLE/MESA REDONDA #4- THE FUTURE OF COMFAUNA

Chair: Dr. Richard Bodmer
Rappoteur: Ing. Tula Fang
Participants: FUNDAMAZOINIA and All conference participants

- Prof. Pedro Mayor Aparicio
- Ing. Kymberlyn Chota
- Dr. Michael Valqui
- Dr. Pablo Puertas
- Dr. William Bodmer
- Prof. Gary Wayne Garcia

ROUND TABLE/MESA REDONDA #5
Round Table- Neo-tropical animal pests: The Case of Small Island States-opportunities

Chair: Prof. William Martin Mollineau
UTT
Rapporteur: Dr. Sarojani Ragbir,
Communication Specialist, Faculty of Food and Agriculture, UWI

ROUND TABLE/MESA REDONDA #6
Local Round Table Discussion on Hunting in T&T

Chair: Mr. Anil Roopchand
Rapporteur: Mr. Wendell Chad Rackal

-Mr. Buddy Miller
Confederation of Hunting associations of T&T
- Mr. Mohan Bolarsingh
South Eastern Hunters Association
- Ministry of the Environment and Water Resources
- Ministry of Food Production
- Ministry of Education
- Ministry of Tertiary Education
- Ministry of Local Government
- Ministry of Community Development
- Ministry of Tourism
- EMA

ROUND TABLE/MESA REDONDA #7
Neo-tropical Animal Education

Chair: Dr. Wayne Ganpat/Prof. Janette Morris
Rapporteur: Miss. Laura Tardieu [Ph.D. candidate, UWI]

ROUND TABLE/MESA REDONDA #8: Caribbean Council for Higher Education in Agriculture [CACHE]

Chair: Dr. Isaac Bekele
Dean, Faculty of Food and Agriculture
The University of the West Indies
Rapporteur: Miss Stacey Syne [Ph.D. Candidiate UWI]
Volunteer Assistants MR#6:
Mr. Robert Tjien Fooh
Dr. Alexander Nikov

ROUND TABLE/MESA REDONDA/WORKSHOP #9

La fauna Silvestre Neotropical como soberania alimentaria: es hora para la zoocria? [Neotropical Wildlife as food sovereignty: is it time for wildlife farming?]

Chair: Dr. Wendy R. Townsend
Rapporteur: Prof. Eugene C. Crichlow,
Emeritus Professor of Livestock Science

17:RT9:1
Title: **INVISIBILITY OF BUSHMEAT TRADE CHAINS AND PARTICIPATORY MONITORING IN THE AMAZONIAN TRIFRONTIER REGION OF COLOMBIA, PERU & BRAZIL**

Authors**:** Cruz D, van Vliet N., Quiceno-Mesa MP, L. Neves de Aquino, Yague B., Hernandez S., Pinedo M. & Nasi R
Email: danielcruz@fundsi.org
danielcruzantia@gmail.com
Country: Colombia

Abstract:
In many riverside urban and rural areas of tropical forests the trade of bushmeat stays dynamic and contributes to the well-being of local communities, being essential for their livelihoods and food security, even in contexts of nutritional transitions from traditional sources of meat towards domestic and processed meat, caused by urbanisation and the expansion of market economies (van Vliet et al, 2014). The contribution of bushmeat to local economies in Latin America have not been exhaustively quantified neither analized, due to the context of ilegality that makes bushmeat trade invisible through clandestine social networks difficult to describe. This has led to an underestimation of the magnitude of bushmeat traded and its economic importance. With the aim to understand the magnitude of the market chain in the Amazonian trifrontier region between Colombia, Brazil and Peru, we identified 195 key actors within the market chain, and established a participatory monitoring at the level of hunters (60 days) and traders (20 days) during two hydroclimatic periods in 2013, that allowed us to register a total of 13.7 tons of bushmeat captured by hunters (from 29 species) and 6.7 tons of bushmeat sold by market sellers (from 19 species) being Cuniculus paca and Tapirus terrestris the most traded species. This data allowed us to calculate that aproximately 160 tons of bushmeat are traded per year in market places of the trifrontier. Based on the interest of traditional authorities we propose a collaborative scheme for the legal aproveitation of resilient and preferred species such as Cuniculus paca that allow local communities to receive benefits from bushmeat sustainably and equitably.

17:RT9:2

Title: **CONSUMO DE PESCADO Y FAUNA ACUÁTICA EN LA CUENCA AMAZÓNICA VENEZOLANA: ANÁLISIS DE NUEVE CASOS DE ESTUDIO ENTRE COMUNIDADES INDÍGENAS**

Authors: Carlos A. Lasso
Email: classo@humboldt.org.co
Country: Colombia

Abstract:

Se analizan nueve casos de estudio de grupos indígenas asentados en la cuenca amazónica venezolana: étnias Baniva, Baré, Curripaco, Piapoco, Warequena, Yanomami y Yeral. Este es un estudio bibliográfico elaborado según los requerimientos y lineamientos del Departamento de Pesca y Acuicultura de la FAO, para evaluar la importancia y el aporte de la pesca y el consumo de otros renglones de la fauna acuática a la seguridad alimentaria de los países amazónicos. Los casos de estudio fueron publicados en diferentes revistas científicas y otras publicaciones entre 1979 y 2007. De cada caso de estudio se refleja el área geográfica considerada y los resultados obtenidos en cuanto al papel de los productos de la pesca y de otras fuentes de proteína en la alimentación de las poblaciones indígenas de la zona. En el análisis de los resultados se llega a la conclusión de que la pesca es la principal fuente de alimento proteico para estas poblaciones y, aunque los niveles de explotación de los recursos pesqueros son considerados bajos o moderados, se recomienda diversificar el uso de estos recursos mediante el desarrollo de la pesca deportiva y la captura y comercialización de peces ornamentales, actividades consideradas con buen potencial para mejorar las condiciones de vida de la población indígena de la zona.

17:RT9:3

Title: **USO Y APROVECHAMIENTO DE LA FAUNA ACUÁTICA DE COLOMBIA**

Authors: Monica A. Morales-Betancourt y Carlos A. Lasso
Email: mmorales@humboldt.org.co
Country: Colombia

Abstract:

La fauna acuática tiene una gran importancia en las comunidades rurales de Colombia. Esta radica en que principalmente son fuente de proteína, así como también son utilizadas para el ornamento, de forma medicinal, como mascotas y aún juega un papel primordial en las culturas indígenas debido a su uso ancestral. Entre los grupos más representativos están las tortugas, crocodílidos, aves y mamíferos. En cuanto a las tortugas, de las 27 especies continentales 22 son consumidas, las más representativas son la hicotea (Trachemys callirostris) y la tortuga del río Magdalena (Podocnemis lewyana) distribuidas en las cuencas Caribe y Magdalena. En la depresión Momposina (Magdalena) la declinación poblacional e inclusive la extinción local de los quelonios preferidos como P. lewyana, está ocasionando una reorientación de la captura y consumo hacia las demás especies de tortugas, inclusive para aquellas no preferidas anteriormente, como Kinosternon scorpiodes. Las tortugas del genero Podocnemis (P. expansa, P. unifilis y P. vogli) de las cuencas Amazonas y Orinoco son objeto de consumo, en primera instancia el consumo estaba dirigido a P. expansa que es la de mayor tamaño del género, sin embargo al declinar sus poblaciones este aprovechamiento se dirigió a las otras dos especies. En cuanto a los crocodílidos en el país habitan seis especies, en las cuencas Caribe y Magdalena su aprovechamiento está dirigido principalmente para la extracción de la piel, las especies objeto son Crododylus acutus y Caiman crocodilus los cuales sólo pueden aprovecharse mediante la zoocría. En cuanto al consumo está dirigido a las tres especies de menor tamaño, las babillas (Caiman crocodilus) que se encuentran en todo el país y los cachires (Paleosuchus palpebrosus y Paleosuchus trigonatus) de las cuencas Amazonas y Orinoco. De las serpientes sólo existe información para la anaconda (Eunectes murinus) que es aprovechada por las comunidades locales de la Amazonia y Orinoquia. En cuanto a las aves, de un listado de 140 especies de hábitos dulceacuícolas siete son usadas principalmente para el consumo, sin embargo, este número esta subestimado. Los mamíferos están representado por dos especies de manatíes Trichechus manatus que se encuentra en las cuencas Caribe, Magdalena y Orinoco y Trichechus inunguis de la cuenca Amazonas, ambas especies son consumidas tradicionalmente; dos nutrias (Ptenorura brasiliensis y Lontra longicaudis) utilizadas principalmente como mascotas y recientemente Lontra longicaudis es consumida en La Guajira por los nuevos colonos debido a la escasez de alimento; los dos delfines de río (Inia geoffrensis y Sotalia fluviatilis) los cuales recientemente están siendo capturados para utilizarlos como carnada en la pesca de la mota o simi (Calophysus macropterus) especie que está remplazando el capaz del Magdalena debido a que las capturas de este último han disminuido.

17:RT9:4

Title: **NEO-TROPICAL ANIMAL (WILDLIFE) FARMING IN THE REPUBLIC OF TRINIDAD AND TOBAGO**

Author(s): Rackal, C. W; Mollineau, W.M; Macfarlane, A.R; Singh, D.M; and Garcia, G.W

Email: **wendell.rackal@gmail.com**

Country: T&T

Abstract:

This paper seeks to highlight the history, the trends, the benefits, and to inform and educate on Neo-tropical Animal (wildlife) farming in the Republic of Trinidad and Tobago. The Neo-Tropics (or New World Tropics) is one of the eight terrestrial ecosystems of the earth, specifically located 33□° North Latitude and 33□° South Latitude, between the Tropics of Capricorn and the Tropics of Cancer. The Neo-tropics boasts of having 25% of all the known mammals, 33% of all birds of the World, 19% of Worlds reptiles and 46% of World Amphibians. The captive rearing of these animals has been in existence in Trinidad and Tobago long before the Forestry Division. Aalthough a contentious conservation measure, it proposes tremendous opportunities, not limiting to: positive environmental impact and green footprint, conservation, rural development, employment, food security and if carefully developed and managed, could diminish the food import bill significantly. The project was a collaborative effort between the University of the West Indies and the Forestry Division-Wildlife Section. The aims and objectives were to (1) to quantify the number of wildlife farmers & their animal populations (species, sex) in 2012 (2) to assess trend in wildlife farming during the period 2004 - 2012 . A list of 362 registered wildlife farmers was obtained from the Forestry Division, Wildlife Section. The results for the farming population indicated that 94.8% of the farmers who participated were registered farmers. A total of eighty-three (83) registered farmers were found to be active, which accounted for 82.2% and eighteen (18) of those farmers found during the survey accounted for 17.8%. One hundred and one (101) or 60.84% of those contacted were actively engaged in wildlife farming. The majority or 97% of the farmers kept their animals for non-commercial reasons (non-sale) and the majority of persons 29.7% (30) kept their animals for the sole purpose of breeding. It was concluded that there is a continuous increase (3066.67% from 1984-2013) in the number of registered applicants. There was an increase in the quantity of animals held from 2004- 2012 and with animal population in captivity expanded from being the conventional “hunted” species to protected species, non-indigenous species and even animal which are regared ‘pests’ by the law of Trinidad and Tobago with the majority of farmers rearing agouti.

17:RT9:5
Title: **WILDLIFE FARMING IN TOBAGO**
Author(s): Angela P. Ramsey
Email: angelapr7@gmail.com
Country: T&T
Abstract:

Tobago is the smaller of the twin island Republic of Trinidad and Tobago, with a land space of 300km (40km in length and 10km in width). It is situated northeast of Trinidad, Southeast of Grenada, and south of the Atlantic hurricane belt. According to the 2011 census Tobago has a population of 60,874, and an economy dependent mainly on funding from Trinidad, and tourism. Tobago's Biodiversity includes 210 species of birds, 123 species of butterflies, 21 species of snakes (nonpoisonous), 12 endemic species of vascular plants, 100 species of mammals found in both Trinidad and Tobago. Much of Tobago's Biodiversity can be found in the Main Ridge Forest Reserve, the oldest protected forest in the Western world. In Trinidad and Tobago there is a hunting period for game species from October 1 – February 28, and a closed period from March 1 – September 30 annually. However, all does not strictly observe the closed period and as a result there is illegal hunting In an effort to manage game hunting in Tobago, wildlife farming was encouraged and started in 1988. The objective then was to captive breed game species such as agouti (*Dasyprocta leporina*), and peccary (*Tayassu tajacu*) to supply a wild meat market, as an alternative to illegal hunting. Conservationist and hunters formed the Wildlife Farmers' Association, and operated for just over a decade, growing from one farm to small wildlife farms throughout the villages of Tobago. During this time this objective was not realized due to the absence of legislation to allow the structured sale of wild meat within the closed hunting period. In an effort to sustain wildlife farming until the appropriate legislation was developed or amended, the Forestry Division, Tobago, kept a management registry, monitored, and technically supported these farmers. Today, there is still the absence of legislation to allow the structured sale of wild meat in the closed hunting season. However, there are presently, 60 wildlife farmers registered and these farms are used for eco-tourism, outreach and education.

17:RT9:6
Title: **CARACTERIZACIÓN DEL USO DE LA FAUNA Y MEDIOS DE VIDA EN LA SELVA DE MATAVÉN (VICHADA, COLOMBIA) A TRAVÉS DE INVESTIGACIÓN PROPIA.**
Authors: Polanco-Ochoa, R. & S. Restrepo
Email: rocioluzhelena@gmail.com
srestrepo@humboldt.org.co
Country: Colombia
Abstract:
Las aproximaciones al conocimiento sobre el uso actual de la fauna silvestre en Colombia han sido diversas en cuanto a su identidad disciplinar, interés congnitivo, ubicación espacial y formas de colaboración con diferentes grupos sociales. En muchos casos, el ejercicio investigativo ha tenido un carácter descriptivo ajeno a los procesos locales de desarrollo y toma de decisiones en los medios de vida tradicionales. A partir de las experiencias derivadas de un proyecto en la Selva de Matavén, en el

Escudo Guayanés colombiano, presentamos resultados de un ejercicio colaborativo de investigación y monitoreo enfocado en la caracterización del uso de la fauna en el marco de sus medios de vida tradicionales, destacando sus contribuciones a la alimentación y el bienestar local. Esta presentación discute la relevancia de considerar esquemas de trabajo colaborativo con las comunidades locales (investigación propia y monitoreo local), así como incorporarse al análisis de sus medios de subsistencia. Los resultados de este estudio demuestran que el consumo de fauna silvestre en un contexto indígena altamente transformado puede variar desde lo marginal hasta lo fundamental, según las características del socioecosistema y de los grupos de fauna trabajados y requiere de aproximaciones al conocimiento que sean propias y estén vinculadas a los medios de vida sostenibles. Este trabajo descata innovaciones metodológicas respecto a los estudios de uso de fauna desde la perspectiva local y comunitaria, las que están relacionadas con la aproximación conceptual inicial, la puesta en práctica del manejo adaptativo y la utilización de la información en la toma de decisiones para mejorar la sostenibilidad de los medios de vida.

17:RT9:7

Title: **CARNE DE MONTE Y SEGURIDAD ALIMENTARIA: ¿CUÁLES SON LAS PREGUNTAS ADECUADAS?**

Authors: Vargas-Tovar, N. & S. Restrepo
Email: nancyvargastovar@gmail.com
srestrepo@humboldt.org.co
Country: Colombia

Abstract:
El uso de fauna silvestre con fines alimentarios ha sido ampliamente reconocido como una contribución directa de la biodiversidad al bienstar humano. Aunque existe investigación relativa a los efectos del uso de fauna silvestre sobre diferentes grupos de especies, poco se ha discutido respecto a sus contribuciones a la alimentación en los usuarios. Partiendo de una escripción del estado de la investigación que se hace en Colombia alrededor de la carne de monte en el marco de sus relaciones con la seguridad alimentaria, esta presentación identifica puntos clave a tenerse en cuenta. A partir de la revisión y análisis de estudios sobre uso de fauna silvestre realizados entre 2001 y 2011, se presenta información sobre métodos utilizados, duración de las investigaciones y poblaciones humanas involucradas, al tiempo que se identifican vacíos y necesidades investigativas particulares del vínculo entre las dinámicas de uso y sus contribuciones a la soberanía y seguridad alimentaria. Al final se hacen algunas recomendaciones para abordar estudios futuros que contribuyan a enirquecer la discusión sobre el valor de la fauna silvestre para el bienestar humano desde enfoques más integrales.

17:RT9:8

Title: **POTENCIALES Y LIMITACIONES DE LA ZOOCRÍA COMO ALTERNATIVA PARA LA SUBSISTENCIA Y LA SEGURIDAD ALIMENTARIA DE COMUNIDADES LOCALES EN COLOMBIA**

Authors: Vargas-Tovar, N. & S. Restrepo
Email: nancyvargastovar@gmail.com
srestrepo@humboldt.org.co
Country: Colombia

Abstract:

La zoocría de subsistencia y con fines alimentarios es considerada como una alternativa para evitar la pérdida de fauna silvestre en contextos de uso consuetudinario. Aunque poco se ha discutido alrededor a los factores que condicionan el éxito de esta práctica, es común que se promueva el desarrollo de alternativas productivas como fuente de proteína y bienestar. En Colombia tanto la zoocría de subistencia como aquellas orientadas a la investigación y al repoblamiento silvestre han sido poco desarrolladas desde el punto de vista práctico y normativo, contrario a lo que ocurre con la zoocría comercial que, en la mayoría de los casos, ha definido rutas de trabajo incluso al nivel de la subsistencia. Presentamos un ejercicio analítico basado en la revisión de estudios de caso, en el que evaluamos criterios relacionados con los vacíos, limitantes y los fracasos que ha tenido Colombia en este tipo de iniciativas. El análisis realizado presenta como conclusiones pautas y acciones que deben tener en consideración para desarrollar la zoocría como una alternativa factible para la seguridad y soberanía alimentaria de las comunidades locales en Colombia. El estudio propone que las alternativas productivas fundamentadas en la zoocría de subsistencia, si bien son importantes para el bienestar local, deben promoverse de la mano de innovaciones institucionales alrededor de las dinámicas de uso sostenible de especies de interés cinegético.

POSTERS

Title: **ESTADO DE CONSERVACIÓN DE LA COTORRA CABECIAMARILLA (*Amazona barbadensis*) EN EL OCCIDENTE DE VENEZUELA**

Author(s): Jessica Ortega-Argüelles
Email: ortegaarguelles@gmail.com
Country: Venezuela---------1

Abstract:

Spanish

La Cotorra cabeciamarilla (Amazona barbadensis), es el único loro del género Amazona adaptado a las zonas áridas y semiáridas de Venezuela y Bonaire. La especie es categorizada como Vulnerable por la IUCN, principalmente por la extracción de pichones para el comercio ilegal. En Bonaire y Margarita, planes de conservación han sido aplicados, sin embargo, es prioritario evaluar el estado de las poblaciones en zonas continentales donde su distribución es más amplia. El objetivo general fue conocer el estado de conservación de la Cotorra cabeciamarilla en el occidente de Venezuela (estados Lara y Falcón), para ello se propuso: 1. Identificar poblaciones de Cotorra Cabeciamarilla en el occidente del país 2. Estimar el tamaño poblacional de la especie en el área de estudio y 3. Identificar las especies vegetales consumidas por Amazona barbadensis. Para ello, se revisaron especímenes en colecciones zoológicas, se registró la especie en varias localidades del área de estudio, así como también se realizaron entrevistas a expertos y pobladores locales en los dos estados mencionados. Durante 7 meses consecutivos del año 2012, se ejecutaron estimaciones poblacionales mediante conteos en dormideros comunales en horas de la tarde (17:00-19:00 horas) mientras que las observaciones de dieta fueron ad libitum en lugares cercanos a los dormideros de la especie en la mañana (06:00-09:00 horas). Las estimaciones poblacionales evidencian al menos 2400 individuos concentrados en 9 dormideros del estado Falcón, donde las agrupaciones de individuos en los municipios Miranda y Democracia tienen mayor importancia, mientras que en el estado Lara se estimaron al menos de 250 individuos en 3 dormideros de los municipios Urdaneta y Torres. Las plantas consumidas variaron según la temporada de fructificación siendo las más importantes Guaiacum officinalle, Astronium graveolens, Prosopis juliflora, y las Cactáceas Stenocereus griseus, Subpilocereus repandus y Pereskia guamacho. En el Estado Lara, el Parque Nacional Cerro Saroche pudiera estar protegiendo algunos sitios importantes para la reproducción de A. barbadensis, a diferencia de lo que ocurre en Falcón, donde el rango de distribución actual no incluye un área protegida; esto condiciona la necesidad de medidas complementarias que garanticen la protección de este psitácido en zonas semiáridas del occidente de Venezuela.

English

The yellow-shouldered Amazon parrot (*Amazona barbadensis*) is the only parrot of the genus Amazona adapted to the arid and semi-arid areas of Venezuela and Bonaire. The species is categorized as Vulnerable by the IUCN, mainly through the removal of chicks for illegal trade. In Bonaire and Margarita, conservation plans have been applied. However, priority is assessing the status of populations in inland areas where their

distribution is wider. The general objective was to find out about the conservation status of the yellow-shouldered Amazon in the west of Venezuela (states of Lara and Falcon). The objectives were as follows: 1. To identify populations of yellow-shouldered Amazon parrot in the west of the country, 2. To estimate the size of the population of the species in the study area and 3 to identify plant species consumed by *Amazona barbadensis*. For this reason, specimens were reviewed in zoological collections, recorded the species in several locations in the study area% 2C as well as interviews with experts and local residents in the two aforementioned States. During 7 consecutive months of the year 2012 % 2C were implemented population estimates by counts in communal roosts in evening hours (17 % 3A00-19 % 3A00 hours) while the comments were of diet ad libitum at locations close to the roosts of the species in the morning (06 % 3A00-09 % 3A00 hours). The population estimates show at least 2400 individuals concentrated in 9 roosts of the Falcon state% 2C where groups of individuals in the municipalities Miranda and democracy have greater importance% 2C while in the state of Lara were estimated at least 250 individuals in 3 roosts of the municipalities Urdaneta, and towers. The plants eaten varied according to the fruiting season being the most important Guaiacum officinalle% 2C Astronium graveolens% 2C Prosopis juliflora% 2C and the cactus Stenocereus griseus% 2C Subpilocereus repandus and Pereskia guamacho. In Lara State% 2C the Parque Nacional Cerro Saroche could protect some important sites for the reproduction of A. barbadensis% 2C in contrast to what happens in Falcon% 2C where the range of current distribution does not include a protected area% 3B this conditions the need for additional measures to ensure the protection of this parrot in semi-arid areas of the west of Venezuela.

Title: **CARACTERÍSTICAS DO COMPORTAMENTO DE ESTRO EM CAITITUS (*Pecari tajacu*) CRIADOS EM CATIVEIRO**

Author(s): Suleima do Socorro Bastos da Silva, Priscila Reis Kahwage, Otavio Mitio Ohashi, Natália Inagaki de Albuquerque, Yvonnick Le Pendu, Diva Anelie Guimarães
Email: ansilvestreufpa@gmail.com
Country: Brazil---------2

Abstract:

Portuguese

Para garantir o sucesso reprodutivo em animais silvestres mantidos em cativeiro, é necessário entender o seu comportamento sexual. Caracterizar a associação entre a dinâmica comportamental de fêmeas de caititus na fase de receptividade sexual e a sua atividade ovariana, pode auxiliar na escolha do momento certo para o emprego de biotecnologias reprodutivas. A aplicação dessas técnicas em animais silvestres evita que estoques vivos sejam retirados da natureza, uma vez que a troca de material genético seria possível entre os centros de criação. O comportamento sexual e a atividade ovariana de 20 fêmeas de caititus (nulíparas, primíparas e multíparas), criadas em cativeiro na Amazônia brasileira, foram monitorados em quatro grupos controles (origem familiar) e experimentais (acasalamento com machos não parentais), durante 60 dias por grupo. As interações sexuais foram filmadas durante três sessões de filmagens semanais, totalizando 1134 horas de gravação. Amostras sanguíneas

foram colhidas a cada 72 horas, para a análise de progesterona plasmática, por meio da técnica do radioimunoensaio. Durante as observações no grupo controle, somente duas fêmeas multíparas foram cortejadas e copularam, e outras quatro já estavam prenhas. As fêmeas nulíparas e primíparas exibiram comportamentos sexuais, foram cortejadas e copularam somente no grupo experimental, quando foram expostas aos machos não parentais. Os comportamentos sexuais de fêmeas e machos aumentaram de frequência do proestro ao estro, diminuindo após a ovulação. Em fêmeas, mordiscar foi o comportamento sexual mais frequente no proestro (36,9%) e no estro (30,8%), seguido de cheirar e queixo sobre o outro (21,2% e 17,0%, respectivamente). Ainda no proestro, os machos apresentaram em maior frequência três comportamentos sexuais: inspeção olfativa, 32,1%; cheirar, 22,8% e mordiscar, 15,0%. A taxa de parição no grupo controle foi de 0,35 fetos/fêmea, e no grupo experimental foi de 1,6 fetos/fêmea. Os resultados indicam que o monitoramento comportamental é uma ferramenta útil para o reconhecimento do período peri-ovulatório, desde que associado aos demais parâmetros fisiológicos. O manejo dessa espécie em cativeiro deve considerar a presença de um possível mecanismo de inibição reprodutiva entre os membros aparentados. Assim, para elevar a eficiência reprodutiva desta espécie em cativeiro, as fêmeas nulíparas devem ser remanejadas do seu grupo de origem familiar.

English

To ensure reproductive success in wild animals kept in captivity it is necessary to understand their sexual behavior. Characterize the association between the dynamic behavior of female caititus in phase of sexual receptivity and its ovarian activity% 2C can help you to choose the right moment for the employment of reproductive biotechnologies. The application of these techniques in wild animals prevents live stock are removed from the nature% 2C since the exchange of genetic material would be possible between the centers of creation. The sexual behavior and ovarian activity of 20 female caititus (nulliparous% 2C primiparous and multiparous women% 2C in captivity in the Brazilian Amazon% 2C were monitored in four control groups (family origin) and experimental (mating with male parental not% 2C during 60 days per group. The sexual interactions were videotaped during three sessions of footage per week% 2C totaling 1134 hours of recording. Blood samples were collected every 72 hours% 2C for the analysis of plasma progesterone% 2C by means of the technique of the radioimmunoassay. During the observations in the control group% 2C only two females were multiparous cortejadas and mated% 2C and other four were already pregnant. The nulliparous females and primiparous exhibited sexual behavior% 2C were cortejadas and mated only in the experimental group% 2C when they were exposed to males not parents. The sexual behavior of females and males increased frequency of proestrus to estrus% 2C decreasing after ovulation. In female% 2C suck was the sexual behavior more frequent in proestrus (36 % 2C9 %) and in estrus (30 % 2C8 %)% 2C followed by smell and chin on the other (21 % 2C2 % 17 % 2C0 %% 2C respectively). Even in proestrus% 2C the males showed greater frequency three sexual behaviors% 3inspection olfactory% 2C 32 % 2C1 %% 3B smell% 2C 22 % 2C8% and nibble% 2C 15 % 2C0 %. The rate of calving in the control group was 0 % 2C35 fetuses% 2Ffemea% 2C and in the experimental

group was 1 % 2C6 fetuses% 2Ffemea. The results indicate that the behavioral monitoring is a useful tool for the recognition of perioperative ovulatório% 2C since that associated with other physiological parameters. The management of this species in captivity should consider the presence of a possible mechanism of reproductive inhibition between members relatives. Thus% 2C to raise the reproductive efficiency of this species in captivity% 2C the nulliparous females should be communities resettled in your group of family origin.

Title: **CAITITUS (*Pecari tajacu*) MANTIDOS EM GRUPOS FAMILIARES SÃO TOLERANTES AO REAGRUPAMENTO DE INDIVÍDUOS APARENTADOS ?**

Author(s): Suleima do Socorro Bastos da Silva, Natália Inagaki de Albuquerque, Surama Pureza da Costa, Milena da Silva Machado; Ana Silvia Sardinha Ribeiro
Country: Brazil---------2

Abstract

Portuguese

A manutenção de caititus em grupos familiares é a forma de agrupamento adotado por centros de criação buscando evitar as agressões mútuas e o estresse induzido pela presença de indivíduos estranhos. O objetivo desse trabalho foi avaliar a reintrodução de um macho adulto ao seu grupo de origem. O experimento foi realizado no criatório científico de caititus (IBAMA 1501.5219/2011-PA) da EMBRAPA Amazônia Oriental em Belém (01°24'S;48°20'W). M121, afastado do grupo por seis meses foi reintroduzido em 06/05/2013. Observações ad libitum foram realizadas cinco dias por semana, duas horas por dia por dois observadores procurando identificar interações agressivas (ataque, mordida e fuga) e amigáveis (aproximação, contato, cheirar e fucinhar) entre os membros do grupo. Em até 24 horas após a reintrodução, a veterinária precisou intervir para curar escoriações provocadas por brigas entre M121 e M208, seu filho mais velho.Após 22 dias de reintrodução M121, passou a aproximar-se dos outros indivíduos e as interações amigáveis, de aproximação e contato nasal começaram a aparecer. As condições de saúde permaneciam boas e as observações continuaram até o dia 23/09/2013 quando M121 foi encontrado morto na baia sem sinais aparentes de perfurações ou traumas. Concluimos que caititus cativos possuem algum tipo de reconhecimento individual que pode ser modificado, mesmo entre indivíduos aparentados geneticamente, quando remoções temporárias são realizadas, o que pode gerar estresse socialmente induzido e morte súbita.

Title: **LA CIENCIA PARTICIPATIVA: HERRAMIENTA FUNDAMENTAL EN EL MANEJO COMUNITARIA DE LA FAUNA SILVESTRE [PARTICIPATORY SCIENCE: FUNDAMENTAL TOOL IN THE COMMUNITY MANAGEMENT OF WILDLIFE]**

Author(s): Wendy R Townsend
Email: **wendytownsend@gmail.com**
Country: Bolivia---------6

Abstract:

Spanish
El manejo comunitario de la fauna silvestre compromete la participación de los cazadores y otros actores en la comunidad. Dicho manejo de fauna implica conocer ciertas informaciones y hacer decisiones sobre las mismas. El conocimiento local (TEK) ecológico es elemental, pero también es importante la investigación de nuevos conceptos, ideas y condiciones. Es muy transformativa involucrar la comunidad o sectores de la comunidad en la búsqueda de la información necesaria para contestar sus preguntas y hacer una decisión. La ciencia participativa ayuda la gente local conseguir familiaridad con conceptos externos, y para creer en los resultados. Se reanima las comunidades, porque los jóvenes sientan atraídos a las herramientas sofisticadas del mundo externo. Las habilidades y destrezas adquiridas en aplicar el método científico a un problema son directamente aplicados al manejo de la fauna silvestre como son: tomar mediciones, anotación de datos, usando computadoras, entre otros de análisis y presentación de resultados. La presentación mostrará experiencia en la aplicación de ciencia participativa con Pueblos Indígenas de Bolivia, Ecuador, y Venezuela.

English
Community management of wildlife involving committed hunters and others in the community. This wildlife management involves knowing certain information and make decisions on them. Local knowledge (TEK) Green is elementary, but it is also important to research new concepts , ideas and terms. It is transformative community involvement or community sectors in finding the information needed to answer questions and make a decision. Participatory science helps local people get familiar with external concepts , and to believe in the results. Communities are revived , because young people attracted to the sophisticated tools of the external world . The skills and abilities acquired in applying the scientific method to a problem they are directly applied to the management of wildlife such as: taking measurements , annotation data , using computers , including analysis and presentation of results . The presentation will experience in the application of participatory science with Indigenous Peoples of Bolivia, Ecuador , and Venezuela .

Title: **PERCEPCIONES LOCALES DEL USO Y MANEJO DE FAUNA SILVESTRE EN ACTORES LOCALES DEL PARQUE NACIONAL QUEBRADA DEL CONDORITO (CÓRDOBA, ARGENTINA)**
LOCAL PERCEPTIONS OF THE USE AND MANAGEMENT OF WILDLIFE IN LOCAL ACTORS CONDORITO GORGE NATIONAL PARK (CORDOBA, ARGENTINA).

Author(s): Manzano, Jessica; Martínez, Gustavo J.; & Barri, Fernando R
Email: gustmart@yahoo.com
Country: Argentina---------12

Abstract:
El trabajo analiza desde una perspectiva etnoecológica con enfoque cuali-cuantitativo las percepciones locales relacionadas con las prácticas de conservación y manejo de fauna silvestre en el Parque Nacional Quebrada del Condorito y Reserva Pampa de Achala, en el centro de Argentina. Se trabajó a partir de la confección de un listado de especies de interés etnobiológico con el aporte y guía de pobladores nativos y foráneos vinculados al área protegida. La información se obtuvo de encuestas semi-estructuradas, junto a registros de observación participante y entrevistas en profundidad. Se identifican pluralidad de percepciones respecto de la importancia, conservación, retracción y/o control de especies de vida silvestre. El análisis de sus contenidos revela la coexistencia de estilos perceptuales, asociados con diferentes perfiles y trayectoria de los actores sociales (visitantes y turistas, guardaparques nativos y foráneos, ganaderos, agentes de conservación y otros). Esto se hace particularmente manifiesto en aspectos como: la identificación de especies problemáticas y emblemáticas; la valoración de los animales domésticos y de la práctica ganadera; las representaciones acerca de los animales plaga; y los criterios de relevancia y utilidad de taxones nativos e introducidos. Finalmente se analizan narrativas que evidencian la percepción acerca de la conservación de dos especies nativas que cuentan con planes de manejo in situ: el condor (*Vultur gryphus*) y el guanaco (*Lama guanicoe*).

Title: **CONSUMER KNOWLEDGE AND PERCEPTION OF THE QUALITY AND SAFETY OF AGOUTI MEAT IN TRINIDAD WEST INDIES**

Author(s): Ria C. Francis, Neela Badrie
Email: rfrancis_18@yahoo.com
Country: T&T ---------- 17

Abstract:

Agouti meat is one of the most popular wild meats consumed in Trinidad and Tobago. The purpose of this study was to determine consumers' level of knowledge of the agouti meat, and how it affects their perception of the safety and quality of the meat. The study comprised both consumers and non- consumers of agouti meat (n=138). The sample was taken from four major regions in Trinidad (Port- of - Spain, San Fernando, Arima and Chaguanas). Data collection was carried out via a questionnaire with questions in the following categories: (i) demographics (ii) agouti/ wild meat consumption; (iii) price of agouti meat; (iv) quality and safety; (v) laws and regulations governing the use and handling of meat. 55.1% of the sample population consumed the agouti meat and mainly did so because they liked the taste (n=61; 80.3%). Although the consumption of agouti meat was high, many were unwilling to spend approximately TT$300 (US$46.58) for 1.82kg (4lbs) of agouti meat as compared to $TT 30 ($US 4.66) for the same weight of chicken. The number of former users was too small to conduct meaningful analysis with respect to reason for discontinuation of consumption. However, 26% (4/15) claimed that they quit eating it because it had become too costly.

Most respondents listed the diseases associated with the agouti as their highest concern when assessing the safety and quality of the meat. There was a significant difference between consumers and non consumers on the question of the agouti meat being equally safe as other meats, like chicken and pork ($p \leq 0.001$). 53.6% of respondents were unaware of the laws and regulations governing the handling and selling of agouti meat. The majority of respondents felt that government laws and regulations however, sometimes help improve the quality and safety of the meat (65.9%). Consumers and non-consumers significantly differed in their perception of the safety of agouti meat ($p \leq 0.001$). Most consumers perceived agouti meat as being safe to eat. Steps should be taken to promote and heighten consumer awareness especially in the area of purchasing and handling of this delicacy.

Title: **INVESTIGATING INDUCED COMPOSTING OF AGOUTI (*Dasyprocta leporina*) WASTE AND ITS NUTRITIVE VALUE TO PLANTS SUBMISSION**

Author(s): Felix N., M. D. Singh, G. W. Garcia and G. Seepersad
Email: nkosif@gmail.com
Country: T&T---------- 17

Abstract:

This paper seeks to investigate the ability of a combination of Lactobacillus sporogenes, and Saccharomyces cerevicae to effectively break down waste from commercial agouti units into a valuable compost. Given the increased popularity of agouti for consumption in Trinidad and Tobago there has been an increase in the establishment of production units. Although the Agouti is a hind gut fermenter which leads to the break-down of the majority of the food consumed, their waste still has a high concentration of ammonia. This leads to an unpleasant scent. In this study, three trials were conducted where agouti waste was collected and treated with a product called Renerzyme manufactured by the Innovative Eco Care Ltd. This product contains the combination of Lacto bacillus sporogenes, and Saccharomyces Cerevicae for a period of three weeks. During this period core temperatures were monitored to identify waste rotation would be needed. At the end of the trial, tests were conducted to identify the levels of Dry Matter, pH, Nitrogen (N), Potassium (K), Phosphorus (P) along with Calcium (Ca), Magnesium (Mg), Sodium (Na), Iron (Fe), Manganese (Mn), Copper (Cu), Zinc (Zn), and Boron (B). The findings of this study aim to assist the economic and environmental feasibility of waste management for agouti production in Trinidad and Tobago which would increase environmental sustainability for the industry.

Title: **EVALUACIÓN NUTRICIONAL DE TRES PLANTAS HOSPEDERAS EN EL CRECIMIENTO Y SOBREVIVENCIA DE LA MARIPOSA BLANCA (*Leptophobia aripa* boisdusval;1836)**

[NUTRITIONAL EVALUATION OF THREE HOST PLANTS ON GROWTH AND SURVIVAL OF THE WHITE BUTTERFLY (LEPTOPHOBIA ARIPA BOISDUSVAL, 1836)]

Author(s): Valencia OJA; González RB; Hernández AMC; Plata PFX; Mendoza MGD; Martínez GJA.
Email: ppfx2221@correo.xoc.uam.mx
Country: Brazil----------17

Abstract:

Spanish

Los lepidópteros son un grupo que por su vistosidad, belleza y valor comercial, ha permitido que la cría en condiciones controladas sea exitosa económicamente. Lo que hace de estas mariposas una alternativa potencial para el uso y conservación de sus ecosistemas en forma sustentable. Dentro de los nutrimentos que los insectos requieren se encuentran substancias nitrogenadas como las proteínas y los aminoácidos, los cuales son fundamentales para su crecimiento desarrollo y reproducción. Se cree que los nutrientes adquiridos en la etapa de larva se convierten en las principales reservas de nutrientes que posteriormente el adulto utiliza para su mantenimiento o reproducción. Objetivo: Evaluar el efecto de la composición nutricional de la planta hospedera (Tropaelum majus; Brassica oleracea y Brassica oleracea) en el desarrollo larvario y crecimiento de la mariposa blanca de ojos verdes (Leptophobia aripa Boisdusval).

Material y métodos. Huevos de Leptophobia aripa Boisdusval provenientes del CIBAC, UAM-X. Se asignaron en una forma completamente al azar a tres especies vegetales: mastuerzo, (Mt; Tropaelum m.); col, (C; Brassica o. var capitata) y coliflor (Cf; Brassica o. var botrytis). Para cada especie vegetal se contó con 4 repeticiones. Alimentación.Cada especie vegetal evaluada se analizó para determinar MS, Proteína Cruda Fibra detergente neutro y ácido (FDN y FDA), Extracto Etereo, Ca, P, Mg y K utilizando un espectrofotómetro NIR.

Consumo y digestibilidad aproximada. A partir de la emergencia de las larvas se cuantificó en base seca tanto el consumo del follaje, PC y la cantidad de heces excretada (H), se utilizó para estimar la digestibilidad aproximada de la MS.

Crecimiento. El crecimiento tisular de las orugas se estimó como la diferencia entre el peso final y el peso inicial del insecto.

Resultados

En cuanto al consumo de MS (Mt,11.48a; C,7.23a; Cf, 11.13ª), PC (Mt, 2.82a; C, 1.01a; Cf, 2.97ª) y la digestibilidad aproximada de la materia seca(Mt,72.83a; C,66.15a; Cf, 82.28ª) no se encontraron diferencias significativas entre los tratamientos; sin embargo, tanto el crecimiento ,g (Mt,7.85a; C,6.60ab; Cf,4.34b) como la Viabilidad, % (Mt,89.00a; C,75.74ab; Cf,69.95b) y el número final de mariposas (Mt,44ª; C,36ab; Cf,32b) fue mayor ($P<0.05$) con la utilización de Mt. (Tropaelum m.)

Conclusiones. La alimentación con Tropaelum m. mejoró el crecimiento, la viabilidad y el número total de mariposas. Sin embargo, se requiere analizar el tipo de carbohidratos que presenta esta especie para explicar su efecto.

English

Lepidoptera are a group whose striking beauty and commercial value, has allowed breeding under controlled conditions is economically successful . What makes these butterflies a potential alternative to the use and conservation of its ecosystems sustainably. Within the nutrients are insects require nitrogen as protein substances and amino acids , which are essential for growth development and reproduction . It is believed that the nutrients acquired larval stage become major nutrient reserve adult subsequently used for maintenance and reproduction . Objective: To evaluate the effect of the nutritional composition of the host plant (Tropaelum majus ; Brassica oleracea and Brassica oleracea) on larval development and growth of the white butterfly on green eyes (Leptophobia aripa Boisdusval) .

Material and methods. Eggs from the Leptophobia aripa Boisdusval CIBAC , UAM -X. Were assigned in a completely random way to three plant species : cress, (Mt ; Tropaelum m .) al , (C , . Brassica or var capitata) and cauliflower (Cf , or Brassica botrytis var .) . For each plant species was counted with 4 replications . Alimentación.Cada evaluated plant species was analyzed for DM, Crude Protein neutral and acid detergent fiber (NDF and ADF) , ether extract , Ca , P , Mg and K using a NIR spectrophotometer.

Consumption and approximate digestibility. From the emergence of the larvae was measured on a dry basis both consumption of foliage, PC and amount of feces excreted (H) , was used to estimate the approximate digestibility of DM .

Growth . The caterpillars tissue growth was estimated as the difference between the final weight and the initial weight of the insect.

results

As for DM intake (Mt , 11.48a , C , 7.23a , Cf, 11.13 ª) , PC (Mt , 2.82a , C , 1.01a , Cf, 2.97 ª) and approximate digestibility of dry matter (Mt , 72.83a , C , 66.15a ; Cf, 82.28 ª) no significant differences were found between treatments ; however, both growth , g (Mt , 7.85a , C , 6.60ab ; Cf, 4.34b) as Viability , % (Mt , 89.00a , C , 75.74ab ; Cf, 69.95b) and the final number of butterflies (Mt , 44th , C , 36ab , Cf, 32b) was higher ($P < 0.05$) with the use of Mt (Tropaelum m.)

Conclusions . Feeding Tropaelum m . improved the growth, viability and total number of butterflies. However , it is required to analyze the type of carbohydrates that this species has to explain its effect.

Title: **FEEDING THE AGOUTI (*Dasyprocta leporina*): A NEO-TROPICAL RODENT WITH POTENTIAL FOR SEMI INTENSIVE PRODUCTION**

Author(s): Sookram, S., Singh, M. D., Mollineau, W., Ramoutar, S. and Garcia. G. W.
Email: samantha_sookram@hotmail.com
Country: T&T---------17

Abstract:
Agouti (*Dasyprocta leporina*) is the most hunted wildlife species in Trinidad and Tobago, as a result Semi intensive systems for captive rearing are being developed in order to decrease the burden on the wild populations. This provides business opportunities for rural communities. This study was done to evaluate the feeding hierarchy of male and female agouti in order to understand their feeding temperament in captivity. Four groups of agoutis were monitored each day when fed. Observations were made to determine if there was any dominant feeder based on the sex of the animal. The animals were fed for twenty (20) days at the same time in a feeding trough. The observations showed male dominance in three of the four cages. The males ate from the trough before the females, in some cases; they went into the troughs and grunt or move their bodies in an aggressive manner preventing the females from feeding in the area. Most days, several females would eat of the ground where grains of feed fell without coming in contact with the males. In one cage, a single female showed dominance over the others. Males showed dominance in feeding in social colonies which suggests that the nutrition and quantity of food left for the females may affect their growth and performance.

Title: **ISOLAMENTO DE *Escherichia coli* DO TRATO GASTROINTESTINAL E FEZES DE CAITITUS (*Pecari tajacu*) CRIADOS EM CATIVEIRO**
[ISOLATION OF *Escherichia coli* OF GASTROINTESTINAL TRACT AND FECES OF CAITITUS (*Pecari tajacu*) BRED IN CAPTIVITY]

Author(s): Roberto de Faria Espinheiro, Pablo Henrique Gonçalves Moraes, Fábio Daniel Florêncio da Silva, Evonnildo Costa Gonçalves, Natália Inagaki de Albuquerque, Suely Regina Mogami Bomfim , Hilma Lúcia Tavares Dias
Email: rfaria87@hotmail.com
Country: Brazil----------21

Abstract:
Portuguese
Este trabalho teve como objetivo a indentificação de *Escherichia coli* do trato gastrointestinal e fezes de caititu (*Pecari tajacu*) criados em cativeiro, assim como testar a eficácia de antimicrobianos sobre as bactérias isoladas. Foram utilizadas 20 fêmeas, com idades de um a dois anos, mantidas em baias experimentais de 2m X 6m no criatório científico da Embrapa Amazônia Oriental (Belém-PA), no qual foram colhidas amostras de quatro diferentes porções do estômago (bolsa gástrica, saco cego ventral, saco cego dorsal e estômago glandular), intestino delgado e fezes para avaliação bacterilógica no Laboratório de Tecnologia Biomolecular LTB/UFPA. As amostras foram semeadas em Agar MacConkey e Agar Sangue de carneiro desfibrinado a 5% e incubadas em estufa bacteriológica à 37ºC por 24 a 48 horas. As bactérias que apresentaram crescimento foram submetidas às provas bioquímicas para identificação e classificação e confirmadas na reação de cadeia em polimerase (PCR). As bactérias foram também testadas frente aos antimicrobianos: ampicilina,

ácido nalidíxico, cefalotina, cefotoxina, clorafenicol, eritromicina, estreptomicina, gentamicina, lincomicina, nitrofurantoina, penicilina G, sulfonamida e tetraciclina. Foram obtidos 76 isolados de *E. coli* do trato gastrointestinal e fezes com a seguinte distribuição: 13 (17%) da bolsa gástrica, 14 (18,4%) do saco cego ventral, 10 (13%) do saco cego dorsal, nove (11,8%) do estômago glandular, 11 (14,4%) do intestino delgado e 19 (25%) das fezes. Das 76 bactérias identificadas pela prova bioquímica, 48 (63%) foram confirmadas na PCR. As cepas de *E.coli* testadas frente aos antibióticos apresentaram sensibilidade ao ácido nalidíxico (100%), cefotoxina (100%), gentamicina (100%), nitrofurantoina (100%), ampicilina (94,7%), clorafenicol (98,7%), estreptomicina (98,7%), sulfonamida (92%) e tetraciclina (90,8%), e resistentes a lincomicina (100%), penicilina G (100%) e eritromicina (93,3%). Conclui-se que a maioria das bactérias *E.coli* isoladas do trato gastrointestinal e fezes dos caititus apresentou alta sensibilidade antimicrobiana, no entanto, alguns isolados foram altamente resistentes, sugerindo mais estudos sobre a resistência antimicrobiana dessa bactéria entérica.

English

This work was aimed at the identification of Escherichia coli of gastrointestinal tract and feces of collared peccary (Pecari tajacu) bred in captivity% 2C as well as test the effectiveness of antimicrobials on the isolated bacteria. Were used 20 female% 2C aged one to two years% 2C maintained in experimental pens of 2m X 6m in scientific put the Embrapa Eastern Amazon (Bethlehem, PA% 2C in which samples were collected from four different portions of the stomach (gastric pouch% 2C bag blind lap% 2C bag blind and dorsal glandular stomach% 2C small intestine and feces for evaluation bacterilógica in Laboratory of biomolecular Technology LTB% 2FUFPA. The samples were plated on agar and MacConkey agar defibrinated sheep blood at 5% and incubated in an incubator bacteriological to 37 C for 24 to 48 hours. The bacteria that showed growth were submitted to biochemical tests for identification and classification and confirmed in the reaction chain reaction (PCR). The bacteria were also tested antimicrobials susceptibility% 3ampicillin% 2C acid nalidíxico% 2C cephalothin% 2C cefotoxina% 2C clorafenicol% 2C erythromycin% 2C streptomycin% 2C gentamicin% 2C lincomycin% 2C nitrofurantoin% 2C penicillin G% 2C sulfonamide and tetracycline. Were obtained 76 isolates of E. coli from the gastrointestinal tract and feces with the following distribution% 313 (17 %) of the gastric pouch% 2C 14 (18 % 2C4 %) blind bag lap% 2C 10 (13 %) of blind bag dorsal% 2C nine (11 % 2C8 %) of glandular stomach% 2C 11 (14 % 2C4 %) of the small intestine and 19 (25 %) of feces. Of the 76 bacteria identified by biochemical evidence% 2C 48 (63 %) were confirmed by PCR. The E. coli strains tested front to antibiotics showed sensitivity to acid nalidíxico (100 %)% 2C cefotoxina (100 %)% 2C gentamicin (100 %)% 2C nitrofurantoin (100 %)% 2C ampicillin (94 % 2C7 %)% 2C clorafenicol (98 % 2C7 %)% 2C streptomycin (98 % 2C7 %)% 2C sulfonamide (92 %) and tetracycline (90 % 2C8 %)% 2C and resistant to lincomycin (100 %)% 2C penicillin G (100 %) and erythromycin (93 % 2C3 %). It is concluded that the majority of the bacteria E. coli isolated from the gastrointestinal tract and feces of caititus showed high antimicrobial sensitivity% 2C however% 2C some isolates were highly resistant% 2C suggesting more studies on antimicrobial resistance of enteric bacteria.

Title: **HISTIOCITOMA FIBROSO MALIGNO BILATERAL NA FACE DE CUTIA (*Dasyprocta fuliginosa*), NO PARQUE AMBIENTAL CHICO MENDES, ACRE, BRASIL**

Author(s): Giovana Barbosa Morais[1]; Raimunda Beserra da Silva; Claúdio de Andrade Sales; José Conceição do Nascimento Guimarães, Joseline de Oliveira Guimarães Cancian; Maria do Carmo Portela; Vânia Maria França Ribeiro; José Cláudio Carneiro de Freitas, Francisco Glauco de Araújo Santos
Email: **gih.barbosa1@gmail.com**
Country: Brazil----------21

Abstract:

O histiocitoma fibroso (HF) ou dermatofibroma é uma proliferação de células fusiformes localizadas na derme, composto por uma mistura variável de fibroblastos, colágeno, histiócitos e vasos sanguíneos. A clínica médica e cirúrgica de animais exóticos e selvagens vem adquirindo crescente importância na prática veterinária moderna e que, constantemente, médicos veterinários especialistas se deparam com diversas etiologias de doenças e tumores, muitas vezes não relatadas na literatura científica, ficando difícil um estudo mais aprofundado sobre o assunto. A cutia (Dasyprocta sp.) é um roedor de médio porte e existente em todo o território nacional. Pertence à classe Mammalia, à ordem Rodentia, família Dasyproctidae e ao gênero Dasyprocta, estando na mesma ordem das pacas, do porquinho-da-índia, do ouriço, das chinchilas e dos preás. Uma fêmea adulta, pesando 2,25kg vivendo em sistema extensivo no Parque Ambiental Chico Mendes, zoológico de Rio Branco, Acre, desde 2009, foi capturada no dia 06 de abril de 2013 após observação de uma anomalia na face, sendo realizada cirurgia no dia 18 de abril de 2013, para extirpação e submissão do exame histopatológico. A massa extirpada media 8cmX5cmX3cm, parecendo encapsulada, de cor branca-acinzentada, com áreas avermelhadas e recoberta em uma das faces pela pele. O material foi fixado em formol a 10%, processado rotineiramente para inclusão em parafina. Cortes de 5µm foram obtidos e corados em HE. No exame histopatológico foram obsevados focos de células inflamatórias, constituídos principalmente por histiócitos, plasmócitos e neutrófilos. Estavam presentes também: células poligonais, com núcleo excêntrico e citoplasma pálido, vacuolizado, com dois a cinco nucléolos por núcleo. Células gigantes, semelhantes a osteoclastos foram observadas. Raras figuras de mitoses anormais puderam ser visualizadas. O tumor continha áreas de necrose focal e áreas de hemorragia. No que diz respeito à vascularização, evidenciaram-se focos intratumorais de vascularização aumentada, com numerosos pequenos vasos sanguíneos e vasodilatação. O diagnóstico foi de histiocitoma fibroso maligno.

The fibrous histiocytoma (HF) or dermatofibroma is a proliferation of spindle cells located in the dermis, composed of a variable mixture of fibroblasts, histiocytes and blood vessels. Clinical medicine and surgery of exotic and wild animals has been gaining increasing importance in modern veterinary practice and constantly veterinary medical specialists are faced with various etiologies of diseases and tumors often not reported in the scientific literature, making it difficult for further study on the subject. The agouti (Dasyprocta sp.) Is a medium-sized rodent and

existing throughout the national territory. Belongs to the class Mammalia, order Rodentia, family and gender Dasyproctidae Dasyprocta, being in the same order of Pacas, the guinea pig, hedgehog, chinchillas and guinea pigs. An adult female, weighing 2.25 kg in extensive living in the Chico Mendes Environmental Park Zoo Rio Branco, Acre system since 2009, was captured on April 6, 2013 after watching an anomaly on the face had undergone surgery the day April 18, 2013, for removal and submission of the histopathological examination. The excised mass medium 8cmX5cmX3cm, looking encapsulated, white-gray color, with reddish and covered on one side by the skin areas. The material was fixed in 10% formalin, processed routinely for paraffin embedding. Sections of 5□m were obtained and stained with HE. In histopathological examination foci of inflammatory cells mainly consisting of histiocytes, plasma cells and neutrophils were obsevados. Also present were: polygonal cells with eccentric nuclei and pale cytoplasm vacuolated, with two to five nucleoli per nucleus. , Similar to osteoclast giant cells were observed. Rare abnormal mitotic figures could be visualized. The tumor contained areas of focal necrosis and hemorrhagic areas. Regarding the vasculature, it is revealed foci of increased intratumoral vasculature with numerous small blood vessels and vasodilation. The diagnosis was malignant fibrous histiocytoma.

Title: **DETECÇÃO MOLECULAR DE 'Candidatus Mycoplasma kahanei' EM UMA POPULAÇÃO DE CATETOS MANTIDOS EM CATIVEIRO [MOLECULAR DETECTION OF 'Candidatus Mycoplasma kahanei' IN A POPULATION OF COLLARED PECCARY KEPT IN CAPTIVITY]**

Author(s): Leopoldo Augusto Moraes, Roberto de Farias Espinheiro, Luciana de Cássia Silva do Nascimento, Elton Brito Everton, Natalia Inagaki de Albuquerque, Evonnildo Costa Gonçalves, Hilma Lúcia Tavares Dias
Email:
Country: Brazil---------21

Abstract:
Micoplasmas hemotrópicos compreendem um grupo de bactérias que infectam hemácias e podem causar anemia hemolítica e diversas doenças crônicas em animais. Descrevemos o primeiro relato da infecção pela espécie '*Candidatus* Mycoplasma kahanei' em catetos de cativeiro utilizando protocolo convencional de PCR (reação em cadeia da polimerase). Foi analisado o material genético oriundo de amostras sanguíneas de 20 animais adultos mantidos em baias experimentais de 2m x 6m no criatório científico da Embrapa Amazônia Oriental, no estado do Pará, Brasil, sete animais eram do sexo masculino e 13 eram fêmeas, todos encontravam-se clinicamente saudáveis. Após a contenção manual os animais foram submetidos a colheita de sangue e em seguida as amostras foram encaminhadas ao Laboratório de Tecnologia Biomolecular (LBT/UFPA), para serem submetidas a extração e em seguida avaliadas na PCR. Um total de 50% (10/20) das amostras amplificaram fragmento especifico, que foi confirmado através de sequenciamento genético como pertencente à espécie '*Candidatus* Mycoplasma kahanei'. Este estudo além de ser o primeiro relato dessa espécie de micoplasma hemotrópico em catetos evidencia a importância do monitoramento da sanidade de animais selvagens cativos, uma vez que a importância zoonótica dos micoplasmas em humanos ainda é pouco conhecida.

Mycoplasmas hemotrópicos comprise a group of bacteria that infect red blood cells and can cause hemolytic anemia and various chronic diseases in animals. We describe the first case of infection by species 'Candidatus Mycoplasma kahanei' in collared peccary in captivity using conventional protocol of PCR (polymerase chain reaction). It was analyzed the genetic material come from blood samples of 20 adult animals kept in experimental pens of 2m x 6m in scientific put the Embrapa Eastern Amazon% 2C in the state of Para% 2C Brazil% 2C seven animals were male and 13 were female% 2C all were clinically healthy. After the manual containment the animals were submitted to blood collection and then the samples were sent to the Laboratory of biomolecular Technology (LBT% 2FUFPA% 2C to be subjected to extraction and then evaluated in the PCR. A total of 50% (10 % 2F20) of samples amplified fragment specific% 2C that was confirmed through genetic sequencing as belonging to the species 'Candidatus Mycoplasma kahanei'. This study in addition to be the first report of this species of mycoplasma hemotrópico in collared peccary highlights the importance of monitoring the health of wild animals captive% 2C since the zoonotic importance of mycoplasmas in humans is still little known.

Title: **DISTÚRBIOS CONGÊNITOS E DO DESENVOLVIMENTO OBSERVADOS EM ONÇA PINTADA (*Panthera onca*), PACA (*Cuniculus paca*), E SAGUI CARA SUJA (*Saguinus fuscicollis weddelli*), NO MUNICÍPIO DE RIO BRANCO – ACRE**
[CONGENITAL DISORDERS AND DEVELOPMENT OBSERVED IN JAGUAR (*Panthera onca*), PACA (*Cuniculus paca*) AND MARMOSET (*Saguinus fuscicollis weddelli*) IN THE CITY OF RIO BRANCO – ACRE]
Author(s): Giovana Barbosa Morais; Raimunda Beserra da Silva; Tayná de Lima Pontes; Joseline de Oliveira Guimarães Cancian; Maria do Carmo Portela; Vânia Maria França Ribeiro; José Cláudio Carneiro de Freitas; Francisco Glauco de Araújo Santos
Email: gih.barbosa1@gmail.com
Country: Brazil---------21
Abstract:

Teratologia é o estudo de anomalias de desenvolvimento, culminando em alterações morfológicas. Na clínica de animais selvagens, os veterinários vêm se deparando com diversas patologias que, muitas vezes, não são relatados em literatura, dificultando diagnósticos e estudos aprofundados. Estudos envolvendo mamíferos silvestres são de grande importância para conhecer peculiaridades anatômicas e patologias em comum a várias espécies. São relatados três casos de teratologia, observados mediante ectoscopia e necropsia de animais selvagens, no Município de Rio Branco – Acre. As malformações foram observadas em animais encaminhados ao Parque Ambiental Chico Mendes, bem como do Projeto “Caboclinho da Mata” e Centro de Triagem de Animais Selvagens - CETAS, localizados na cidade de Rio Branco, Estado do Acre, Brasil e diagnosticadas à ectoscopia e necropsia. Foram examinados uma onça pintada (Panthera onca), uma paca (Cuniculus paca), e um sagui cara suja (Saguinus fuscicollis weddelli). Os casos foram documentados através de fotografias e as peças depositadas no Laboratório de Histologia e Histopatologia, da Universidade Federal do Acre. A causa mortis da onça pintada foi insuficiência cardiorrespiratória devido a um quadro de aplasia segmentar , na porção cervical do esôfago, que ocasionou uma obstrução mecânica por alimento não digerido, desenvolvendo um quadro secundário de pneumonia. A causa mortis da paca foi traumatismo, sendo constatada, à ectoscopia, micromelia nos quatro membros. O sagui cara suja veio a óbito devido à insuficiência cardiorrespiratória, sendo que a agenesia do pericárdio não aparentou ter tido influência na causa mortis e caracterizado como um achado incidental de necropsia. Relatos sobre a ocorrência de teratologia são de grande importância para difusão do conhecimento sobre animais selvagens e em patologias ainda não relatadas em literatura atual.

Teratology is the study of abnormalities of development% 2C culminating in morphological changes. At the clinic in wild animals% 2C vets has been facing various pathologies that% 2C many times% 2C are not reported in the literature% 2C making diagnoses and detailed studies. Studies involving wild mammals are of great importance in understanding anatomical peculiarities and pathologies in common to several species. Three cases are reported of teratology% 2C observed by ectoscopy and necropsy of wild animals% 2C in the City of Rio Branco, Acre, Brazil. The malformations were observed in animals sent to Chico Mendes

Environmental Park% 2C as well as the Project "Caboclinho da Mata" and Sorting Center of Wild Animals - CETAS% 2C located in the city of Rio Branco% 2C State of Acre% 2C Brazil and diagnosed the ectoscopy and necropsy. Were examined a jaguar (Panthera onca% 2C a paca (Cuniculus paca% 2C and a marmoset expensive dirty (Saguinus fuscicollis weddelli). The cases were documented through photographs and parts deposited in the Laboratory of Histology and Histopathology% 2C from the Federal University of Acre. The cause of death of the puma was cardiorespiratory failure due to a framework of segmental aplasia % 2C the neck portion of the esophagus% 2C that caused a mechanical obstruction by food not digested% 2C developing a framework of secondary pneumonia. The cause of death of paca was trauma% 2C was observed% 2C the ectoscopy% 2C micromelia in four States. The marmoset expensive dirty died due to cardiorespiratory failure% 2C and the pericardial agenesis not allied himself have had an influence on causa mortis and characterized as an incidental finding at autopsy. Reports on the occurrence of teratology are of great importance for dissemination of knowledge about wild animals and in pathologies has not yet reported on the current literature.

Title: **AGSC3002, A MEANS OF REMOVING MISCONCEPTIONS, ENHANCING STUDENT KNOWLEDGE ABOUT NEO-TROPICAL ANIMALS AMONG PRIMARY SCHOOL TEACHER TRAINEES AT THE CENTRE FOR EDUCATION PROGRAMMES AT THE UNIVERSITY OF TRINIDAD AND TOBAGO**

Author(s): Davis F.; Hospedales R.; Mollineau W.; Ramjattan V.; Perez L.; Dhanoolal K.; Walker J
Email:
Country: T&T----------28

Abstract:

Title: **CHALLENGES ASSOCIATED WITH ESTABLISHING A NEO-TROPICAL AGOUTI (*Dasyprocta leporina*) UNIT AT FYZABAD SECONDARY SCHOOL, ST. PATRICK EDUCATIONAL DIVISION, REPUBLIC OF TRINIDAD AND TOBAGO.**

Author(s): Charles- Dennis Merlina, Mollineau W., Hospedales R., Davis F., Ramjattan V.
Email: ricardo.hospedales@utt.edu.tt
Country: T&T-------29

Abstract:

Neo-Tropical and Companion Animals (AGSC4001) is one of the courses in the B.Ed. Agriculture Specialization Programme at The University of Trinidad and Tobago. This course was first offered as a distance module in 2012 to an agriculture teacher. The teacher had 12 years attached to the Fyzabad Secondary School St. Patrick Educational Division, South Trinidad, Republic of Trinidad and Tobago (T&T). A Neo-tropical school project is one component of the course. In this case the candidate chose to establish an agouti (Dasyprocta leporina) unit as a teaching resource. This study documented the feelings and challenges experienced during the establishment of the first Neo-Tropical unit established in a secondary school in T&T. The student initially experienced cognitive dissonance when informed about the intervention at the school but immediately used the project method to establishing an agouti unit. A project logical sequence was developed which focused on the five major factors of animal production as the foundation. These factors include Housing and Environment, Nutrition and Feeding, Genetics and Reproduction, Health

and Disease and Socio- economic factors. The proposal thus included a rationale with the objectives of the project and the financial and material resources required. This was then fleshed out into a framework that included the scope of work with the related human resources needed. This plan was then taken to the Principal, who provided support. A search was then made for other resources in the school and community using the goodwill developed with staff, students and community over the years. A pair of agoutis was sourced by approaching an array of persons at the school which is located in a forested, rural part of Trinidad. The persons contacted included Farm attendants, students, school security personnel and teachers who are hunters. One such teacher made contact with a farmer who possessed animals at different physiological stages. A pair of young animals were obtained at a cost of TT$400. The school farm personnel provided housing and equipment, and labour. Fruit trees such as pommecythere (Spondias dulcis), pommerac (Syzygium malaccensis) and banana (Musa spp.) planted at the school over the years provided food for agoutis. Approval to rear Neo-tropical animals must be provided by the Wildlife Section of the Forestry division. Such a license was applied for and approved. At present, a larger unit is being prepared and plans are in place to increase the colony size. A flow chart was the outcome of this experience which may be used by other secondary schools to establish Neo-Tropical units as this topic in included in the CAPE (Caribbean Advance Proficiency Examination) Agriculture Syllabus with initial delivery scheduled for September 2014.

Title: **ADVANTAGES ASSOCIATED WITH ESTABLISHING A NEO-TROPICAL GUINEA PIG (*Cavia porcellus*) UNIT AT A SECONDARY SCHOOL IN TRINIDAD AND TOBAGO.**

Author(s): Boodram S., Gopaul S.
Email:
Country: T&T---------29

Abstract:
The Bachelor of Education Programme at the University of Trinidad and Tobago includes one specialization which is Agricultural Science. Neo-Tropical and Companion Animals (AGSC4001) is one course integrated into the Agriculture Specialization Programme. It is a module that is included in the CAPE (Caribbean Advance Proficiency Examination) Agriculture Syllabus which is scheduled to become active from September 2014. An element of the course, the prospective teachers are entitled to establish a guinea pig (*Cavia porcellus*) unit in a secondary school as a teaching resource. This article will document the experience during the establishment of the Neo-Tropical unit in a secondary school in Trinidad and Tobago. The main objective was to introduce this unit to the secondary school so that the principal, teachers and students can be aware of the advantages of these neo tropical animals in the school's curriculum. The general objectives consist of utilizing wild life animals as a source of economical revenue as well as displaying positive attitudes towards wildlife. It was further fleshed out into specific objectives that embraced performing cultural practices involved in rearing guinea pigs, developing the student's responsibility roles, acquiring skills for further pursue of education in this area, acquisition of skills for future

entrepreneurship (marketing for sales, building of the unit and housing). While implementing this unit the five factors of animal production Housing and Environment, Nutrition and Feeding, Genetics and Reproduction, Health and Disease and Socio- economic factors was included. The research information was accumulated and bargained on the type, size, design and shape of the cage were made by both my colleague and I. Forage plots included the different forages such as Urochloa mutica (Para grass), Brachiaria arrecta (tanner) to provide nutrition for these animals. A pair of guinea pigs was bought at US $12.50 to be placed into the unit. The design included an accessible moving cage. The cage was made with sufficient space and included wheels. The opening of the cage was solely at the top for convenience. The unit contained locks to ensure the safety of the animals. The cage was made using good quality materials to incorporate durability. With materials and labour it amounted to US $234.40. The advantages of using the guinea pigs and this design were that to guarantee that it is a good teaching resource. Firstly guinea pigs were used because of the limited space that was given to work with. The guinea pigs took up lesser space that normal livestock would. Also it was designed in such a way that it can be easily taken to the classroom to accommodate different teaching strategies. The students will also have the opportunity of having a hands-on experience with the neo tropical animals. Based on cost and flexibility it is a good project to establish in the secondary school to accommodate the module in the CAPE syllabus.

Title: **CHALLENGES ASSOCIATED WITH ESTABLISHING A BUTTERFLY GARDEN AT RIO CLARO EAST SECONDARY SCHOOL, SOUTH EASTERN DIVISION, REPUBLIC OF TRINIDAD AND TOBAGO.**

Author(s): Adams M., Ramnarine A., Sennon T.
Email:
Country: T&T----------29

Abstract:

Neo-Tropical and Companion Animals (AGSC4001) is one of the courses in the B.Ed. Agriculture Specialization Programme at The University of Trinidad and Tobago. A Neo-tropical school project is one component of the course. In relation to the previously mentioned course, a butterfly garden was developed to attract neo-tropical species (butterflies) in the Rio Claro Area. The goal of this project is to enhance the pedagogical approaches in teaching Caribbean Advance Proficiency Examination (CAPE) Agricultural Science and Caribbean Examination Council (CXC) Agricultural Science. This project was also initiated to provide an opportunity to preserve the natural flora and fauna that exist in and around the Rio Claro East Secondary School. The project logical sequence was developed which focused on the five major factors of animal production as the foundation. These factors include Housing and Environment, Nutrition and Feeding, Genetics and Reproduction, Health and Disease and Socio- economic factors. The proposal thus included a rationale with the objectives of the project and the financial and material resources required. This was then fleshed out into a framework that included the scope of work with the related human resources needed. This plan was then taken to the Principal, who provided support. However financial constraint was experienced throughout the development of the project. A search was then made for resources in the school and

community. From research, flowers that attracted neo-tropical butterflies in Rio Claro such as Forest Mort Bleu *(Caligo eurilochus minor),* Coolie *(Anartia amathea),* Cabbage white *(Pieris rapae),* The Emperor butterfly *(Morpho peleides),* Ruby-spotted Swallowtail (*Heraclides anchisiades idaeus),*were purchased. The school Farm attendant assisted with the tools required for land preparation and other materials such as stones and pavers were found around the school and relocated to the project site. Labour assistance also slowed the development of the project but at the end it was successfully completed.

Title: **PARTICIPATORY MONITORING AND MANAGEMENT OF SUBSISTENCE HUNTING IN THE PIAGAÇU-PURUS RESERVE, BRAZIL.**

Author(s): Marina A. R. M. Vieira (1), Eduardo M. von Muhlen (1) e Glenn H. Shepard (2)
Email: **maaavieira@yahoo.com.br**
Country: Brazil---------34

Abstract:

The Sustainable Development Reserve (RDS) model in Brazil provides legal context for monitoring wildlife with local population protagonism in gathering data and developing strategies for sustainable use. We present results of one year of self-monitoring by hunters in RDS Piagaçu-Purus (RDS-PP), discuss how the observed patterns reflect local hunting regulations, and suggest how this information could be incorporated into a formal management system. The study was carried out in five communities within the RDS-PP. In addition to the offtake data, we interviewed hunters, inquiring about community hunting rules and agreements and analyzed the content of 19 rules of the reserve´s management plan. 509 hunting events were recorded by 37 families (35%). Self-monitoring permitted the evaluation of temporal and spatial fluctuations of hunting activities, notably regarding ease of canoe transport during the high-water season. Though communities have been apprehensive about developing regulations for subsistence hunting, one of the study communities had developed a set of formal rules. Hunting and sale to outsiders and restrictions on external hunters are more immediate concerns shared by local population and external regulatory rules. Such data and understandings are crucial to the management of Protected Areas in the Brazilian Amazon where governance is often limited.

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