Rufford Small Grants Conferences
Format for Conference Proceedings

Research and conservation in Brazil – The importance and advances from Rufford Foundation support

Introduction

The first Rufford Conference in Brazil was an amazing opportunity to share information and integrate all the projects supported by RSG. The conference was held in Recife, Pernambuco State during 30, 31 of January and 01 de February 2017.

See images at –
https://www.facebook.com/projetoconservacaorecifal/posts/1743683085657175

The main aims were completely achieve with a total of 30 lectures and more than 20 Rufford grants from Brazil. Most important proposed and achieved aims were:
* **Exchange knowledge, ideas, and experience in doing research**
* **Discuss about current research issues/challenges;**
* **Create invaluable networking opportunities; and**
* **Increase communication and information between Rufford Foundation and its grant recipients.**

What were the main objectives of the RSG Conference?

The main event goal was to integrate leaders who are working on different research and conservation projects around the world aiming at exchanges of experiences and future collaborations. The event catalyzed the exchange of successful conservation experiences in several ecosystems promoting examples to better improve practices of conservation of biodiversity in the Brazilian territory.

What was the impact of the RSG Conference?

The RSG Conference Brazil had both a local and a global impact on species conservation and integration of research and conservation. Locally, our meeting was an amazing opportunity to integrate to integrate managers and decision makers in the scientific and academic environment.

One of the most important impacts of this RSG Conference Brazil was during the field trip organized for the largest Brazilian coral reefs MPA. The visit was performed for Coral Reefs and mangrove areas in Brazil and the researchers had the opportunity to exchange ideas and to have a full day talking on elaborating possible collaborations. More than 80% of the Conference participants were in the field trip who had never met; however, we observed lots of interactions and ideas exchanged regarding species and habitat conservation.

- **Were there examples of where Rufford Funding has enabled disproportionately large and tangible conservation impacts to be delivered?**

Yes. Some projects presented in Rufford Conference Brazil showed direct conservation impacts as follow:

- ➤ Projeto Conservação Recifal (Pcr): Research, Environmental Education and Conservation of Coral Reefs in Costa Dos Corais Mpa (Pedro Pereira);
- ➤ Ecology and Conservation of the Antillean Manatee (Trichechus Manatus Manatus) in Timonha and Ubatuba Rivers, Northeastern Brazil (Ana Carolina);
- ➤ Installation of Artificial Nests as a Strategy for the Conservation of the Red-Tailed Parrot (Amazona Brasiliensis) (Elenise Sipinski);

- **Were there examples of locally developed approaches to biodiversity management?**

Yes. Some projects presented in Rufford Conference Brazil showed approaches to biodiversity management as follow:

➢ Corals of Bay Project: Research, Monitoring and Management of the Alien Cup Coral in the Todos Os Santos Bay (Ricardo J. Miranda);
➢ Ecology and Conservation of the Antillean Manatee (Trichechus Manatus Manatus) in Timonha and Ubatuba Rivers, Northeastern Brazil (Ana Carolina);
➢ Anthropogenic and Seasonal Determinants of Giant Otter Sightings along Waterways in the Northern Brazilian Amazon (Fernanda Michalski);
➢ Conservation Strategy for Caatinga Howler Monkey (Alouatta Ululata), Northeastern Brazil (Antônio Freire Filho)
➢ Mammal Distribution in a Landscape with High Percentage of Agroforests Exhibits Weak Response to Distance of Remaining Native Forest (Aluane Ferreira);
➢ Occupancy Patterns of Terrestrial Mammals in Riparian Corridors in a Fragmented Landscape in Southern Amazonia (Barbara Zimbres)
➢ What Landscape Features Support The Persistence Of Bat Populations In A Fragmented Amazon? (Ana Martins);
➢ The Collapse of White-Lipped Peccary Populations in Continuous Areas of Atlantic Forest (Darren Norris);
➢ Anthropic Influence on the Occupation Probability of Carnivores in the Caatinga Biome, Northeastern Brazil (Douglas Dias).

- **Were there examples of how has Rufford support helped early career conservationists achieve their goals?**

The majority of participants in Rufford Conference Brazil were **early career conservationists (below 30 years and with maximum of 5 years of professional experience)** highlighted essential financial support from Rufford Foundation to achieve their goals in conservation careers including themes in both marine and terrestrial systems.

- **Were there examples of how Rufford funding has helped support work on species and ecosystems that are traditionally difficult to fundraise for?**

Yes. Some examples are:

➢ Diversity and Conservation of Poroid Fungi (Polyporales) in Fragmented Areas of the Brazilian Atlantic Forest (Viviane Motato-Vásquez);
➢ Seeding Recruitment of a Key Species along an Altitudinal Gradient in the Atlantic Forest: Effects of Seed Dispersal Time, Seed Origin and Recruitment Site (Aline Cavalcante De Souza);
➢ What Landscape Features Support the Persistence of Bat Populations in a Fragmented Amazon? (Ana Martins);
➢ Vulnerability of High Altitude Grasslands to Drought Events (Ilaíne Matos);
➢ Human Chronic Disturbances and their Multiple Ecological Effects on Caatinga Woody Flora (Elaine Ribeiro).

- **Were there examples of how Rufford grants have provided seed funding to build capacity, identify conservation needs and develop replicable models for future projects?**

Yes. The follow works identified conservation needs and develop replicable models for future projects:

- Projeto Conservação Recifal (Pcr): Research, Environmental Education and Conservation of Coral Reefs in Costa Dos Corais Mpa (Pedro Pereira);
- Ecology and Conservation of the Antillean Manatee (Trichechus Manatus Manatus) in Timonha and Ubatuba Rivers, Northeastern Brazil (Ana Carolina);
- Installation of Artificial Nests as a Strategy for the Conservation of the Red-Tailed Parrot (Amazona Brasiliensis) (Elenise Sipinski);

Yes. Some projects presented in Rufford Conference Brazil showed approaches to biodiversity management as follow:

- Corals of Bay Project: Research, Monitoring and Management of the Alien Cup Coral in the Todos Os Santos Bay (Ricardo J. Miranda);
- Ecology and Conservation of the Antillean Manatee (Trichechus Manatus Manatus) in Timonha and Ubatuba Rivers, Northeastern Brazil (Ana Carolina);
- Anthropogenic and Seasonal Determinants of Giant Otter Sightings along Waterways in the Northern Brazilian Amazon (Fernanda Michalski);
- Conservation Strategy for Caatinga Howler Monkey (Alouatta Ululata), Northeastern Brazil (Antônio Freire Filho)
- Mammal Distribution in a Landscape with High Percentage of Agroforests Exhibits Weak Response to Distance of Remaining Native Forest (Aluane Ferreira);
- What Landscape Features Support the Persistence of Bat Populations in a Fragmented Amazon? (Ana Martins);
- The Collapse of White-Lipped Peccary Populations in Continuous Areas of Atlantic Forest (Darren Norris);
- Anthropic Influence on the Occupation Probability of Carnivores in the Caatinga Biome, Northeastern Brazil (Douglas Dias).
- Seeding Recruitment of a Key Species along an Altitudinal Gradient in the Atlantic Forest: Effects of Seed Dispersal Time, Seed Origin and Recruitment Site (Aline Cavalcante De Souza);
- What Landscape Features Support the Persistence of Bat Populations in a Fragmented Amazon? (Ana Martins);
- Vulnerability of High Altitude Grasslands to Drought Events (Ilaíne Matos);

Issues raised and any recommendations made

The results presented at the event must be shared with management actors from different areas of Brazil aiming to increase efficiency of species and habitats conservation. Similarly too many other meeting in Brazil the issue that raised was the actual lack of finatial support for conservation projects in the country. Unfortunately, Brazil in currently at an economic and politician crisis and this has been directly influencing the amount of resources for conservation.

List of participants, conference schedule and abstracts

Day 30/01/17

09:00 – 9:30 - Dr. Pedro Henrique C. Pereira: PROJETO CONSERVAÇÃO RECIFAL (PCR): RESEARCH, ENVIRONMENTAL EDUCATION AND CONSERVATION OF CORAL REEFS IN COSTA DOS CORAIS MPA

09:30 – 10:00 - MSc. Ricardo J. Miranda (UFBA): CORALS OF BAY PROJECT: RESEARCH, MONITORING AND MANAGEMENT OF THE ALIEN CUP CORAL IN THE TODOS OS SANTOS BA

10:00 – 10:30 - Dra. Maíra Proietti (FURG): POPULATION GENETICS OF SEA TURTLES ALONG THE BRAZILIAN COAST

11:00 – 11:30 - Dra. Ana Carolina Meirelles (Aquasis): ECOLOGY AND CONSERVATION OF THE ANTILLEAN MANATEE (TRICHECHUS MANATUS MANATUS) IN TIMONHA AND UBATUBA RIVERS, NORTHEASTERN BRAZIL

11:30 – 12:00 - Dra. Fernanda Michalski (UNIFAP): ANTHROPOGENIC AND SEASONAL DETERMINANTS OF GIANT OTTER SIGHTINGS ALONG WATERWAYS IN THE NORTHERN BRAZILIAN AMAZON

12:00 – 12:30 - Dra. Natália Mamede (Instituto Aqualie): GUIANA DOLPHIN CONSERVATION, SOTALIA GUIANENSIS (VAN BÉNÉDEN, 1864), IN THE SOUTHERN ESPÍRITO SANTO STATE, BRAZIL

14:00 – 14:30 - MSc. Viviana Motato-Vásquez (Instituto de Botânica, SP): DIVERSITY AND CONSERVATION OF POROID FUNGI (POLYPORALES) IN FRAGMENTED AREAS OF THE BRAZILIAN ATLANTIC FOREST

14:30 – 15:00 – MSc. Antônio Freire Filho (Universidade de Lisboa): CONSERVATION STRATEGY FOR CAATINGA HOWLER MONKEY (ALOUATTA ULULATA), NORTHEASTERN BRAZIL

15:00 – 15:30 - MSc. Aluane Ferreira (UESC): MAMMAL DISTRIBUTION IN A LANDSCAPE WITH HIGH PERCENTAGE OF AGROFORESTS EXHIBITS WEAK RESPONSE TO DISTANCE OF REMAINING NATIVE FOREST

15:30 – 16:00 - Dra. Bárbara Zimbres (UNB): OCCUPANCY PATTERNS OF TERRESTRIAL MAMMALS IN RIPARIAN CORRIDORS IN A FRAGMENTED LANDSCAPE IN SOUTHERN AMAZONIA

16:30 – 17:00 - MSc. Aline Cavalcante de Souza (UFRJ): SEEDING RECRUITMENT OF A KEY SPECIES ALONG AN ALTITUDINAL GRADIENT IN THE ATLANTIC FOREST: EFFECTS OF SEED DISPERSAL TIME, SEED ORIGIN AND RECRUITMENT SITE.

17:00 – 17:30 - Dra. Ana Martins (UNB): WHAT LANDSCAPE FEATURES SUPPORT THE PERSISTENCE OF BAT POPULATIONS IN A FRAGMENTED AMAZON?

17:30 – 18:00 - Dr. Darren Norris (UNIFAP): THE COLLAPSE OF WHITE-LIPPED PECCARY POPULATIONS IN CONTINUOUS AREAS OF ATLANTIC FOREST

Day 01/02/17

08:30 – 9:00 - MSc. Elenise Sipinski (SPVS): INSTALLATION OF ARTIFICIAL NESTS AS A STRATEGY FOR THE CONSERVATION OF THE RED-TAILED PARROT (AMAZONA BRASILIENSIS)

09:00 – 9:30 - MSc. Douglas Dias (UFMG): ANTHROPIC INFLUENCE ON THE OCCUPATION PROBABILITY OF CARNIVORES IN THE CAATINGA BIOME, NORTHEASTERN BRAZIL

09:30 – 10:00 - MSc. Ilaíne Matos (UERJ): VULNERABILITY OF HIGH ALTITUDE GRASSLANDS TO DROUGHT EVENTS

10:00 – 10:30 - José Tadeu de Oliveira – ICMBio (APACC): O ICMBio e a proteção ambiental em Unidades de Conservação Costeiras e Marinhas

11:00 – 11:30 - Dr. Jayme Augusto Prevedello (UERJ): THE IMPORTANCE OF KEYSTONE RESOURCES IN HIGH-PRODUCTIVITY ECOSYSTEMS: EXPERIMENTAL TESTS WITH SMALL RODENTS

11:30 – 12:00 - Dra. Elâine Maria dos Santos Ribeiro (UFPE): HUMAN CHRONIC DISTURBANCES AND THEIR MULTIPLE ECOLOGICAL EFFECTS ON CAATINGA WOODY FLORA

12:00 – 12:30 - Dra. Bruna Bezerra (UFPE): **BIOACOUSTICS RESEARCH ON GOLDEN BACKED UAKARIS (CACAJAO MELANOCEPHALUS) AND BLONDE CAPUCHIN MONKEYS (SAPAJUS FLAVIUS)**

14:00 – 14:30 - Dra. Maria Elisabeth de Araújo (UFPE): Recursos naturais costeiros: pescadores e academia

14:30 – 15:00 - Dr. Clemente Coelho Jr. (UPE / IBB): Conservação de Manguezais em unidades de conservação

15:00 – 15:30 - Msc. Fernanda Leal Lorders (UFBA): SPONGIVORY BY FISHES (POMACANTHIDAE FAMILY) ON CORAL REEFS OF TODOS OS SANTOS BAY

15:30 – 16:00 - Dr. Carlos Daniel Perez (UFPE): EVALUATION OF THE STATE OF CONSERVATION OF THE ENDEMIC CORAL MUSSISMILIA HARTTII (VERRILL, 1868) (CNIDARIA: ANTHOZOA) IN BRAZIL

16:30 – 17:00 - MSc. Sara Lucía Colmenares Trejos (UFRJ): FUNCTIONAL TRAIT APPROACHES TO UNDERSTAND ECOLOGICAL PROCESSES OF PALM SPECIES ALONG AN ALTITUDINAL VARIATION GRADIENT IN THREATENED BRAZILIAN ATLANTIC FOREST

17:00 – 17:30 - Dr. Francisco Barros (UFBA): THE LITTLE HUGE BARRA MARINE PARK IN SALVADOR

17:30 – 18:00 – Dra. Anny Keli Aparecida Alves Candido (UFMS): APPLICATION OF UAV IN ENVIRONMENTAL MONITORING

PROJETO CONSERVAÇÃO RECIFAL (PCR): RESEARCH, ENVIRONMENTAL EDUCATION AND CONSERVATION OF CORAL REEFS IN COSTA DOS CORAIS MPA

Pereira PHC[1,2], Santos MV[1,2], Lippi DL[1,2]

1-Projeto Conservação Recifal (PCR) – conservacaorecifal@gmail.com; 2-Department of Oceanography, Universidade Federal de Pernambuco, Recife, PE, Brazil

Coral reefs are one of the most important ecosystems on earth with outstanding biodiversity and structural complexity relevance. Coral ecosystems provide importance economic benefits such as tourism and fishing, social benefits for traditional communities as well as ecological implications for a large number of species that use the area for sheltering, breeding and feeding. Despite this huge relevance coral reefs are been threatened by a series of local and global stressors. Locally, pollution, sedimentation and urban use are severely degrading coral reefs. In global terms, ocean acidification and global warming are also threatening healthy coral ecosystems in the last decades. In this context, the Reef Conservation Project (PCR) with support from Rufford Foundation (since 2012), and other partners, is working to ensure the protection of coral reefs in the largest Brazilian MPA (APA Costa dos Corais), one of the most important coral complex in Brazil and in the world. PCR activities encompass subsidies for zoning implementation, direct conservation actions, research as well as environmental education. Zoning implementation is one of the most efficient conservation measures for coral reefs management and PCR has been supporting this implementation on Praia dos Carneiros since 2012 and more recently has been supporting APACC managers on the zoning of Rota Ecologica. Direct conservation activities have been also performed such as empowerment of more than 10 field agents and maintenance of these agents in order to promote environmental education. Scientific and educational materials have also been produced such as the Biodiversity Guide from APACC and ID clipboards of corals and fish species. Research is also an importance component of our activities with paper published recently as well as participation of conferences in Brazil and abroad. Deeper reefs have been recently investigated for the first time and additionally drones have been used for mapping and monitoring of coral reefs areas. At last, environmental education and extension activities with local fishermen's and lectures have been performed. Therefore, the real need of protection of coral reefs in Brazilian waters is evident with PCR playing an important role on coral reefs conservation with the strong support from Rufford Foundation and other partners.

Key-words: CORAL REEFS, COSTA DOS CORAIS MPA, CONSERVATION, RESOURCES MANAGEMENT

CORALS OF BAY PROJECT: RESEARCH, MONITORING AND MANAGEMENT OF THE ALIEN CUP CORAL IN THE TODOS OS SANTOS BAY

Miranda RJ[1], Lorders FL[1], Costa Y[1], Nunes JACC[1], Barros F[1]

1-Benthic Ecology Lab, Biology Institute, Federal University of Bahia, Salvador, BA, Brazil

The cup-coral (Tubastraea tagusensis and T. coccinea) was introduced in Brazil in the 80's, where it has expanded its distribution and caused impacts on native species, communities and ecosystem functioning. In rocky shores of the south/southeast the cup-coral altered the structure of the benthic community. Most recently in 2011 it was recorded on the coral reefs of the northeast, the most important and biodiverse in the South Atlantic Ocean. The coral reef was reported on the reefs of Todos os Santos Bay (TSB) in Bahia state, which present high levels of endemism with the presence of relic coral species considered priority for conservation. The introduction of sun coral (*Tubastraea tagusensis* and *T. coccinea*) on BTS reefs is a cause for concern regarding the conservation of Brazilian reefs. These reefs often suffer effects from impacts such as coral bleaching, nutrient input, habitat destruction and overfishing which can be synergetic with biological invasions, increasing their vulnerability. The Corals of Bay Project is working since 2013 mainly investigating the impacts of cup-coral on the TSB' reefs as a model to generate information to prevent and / or mitigate potential impacts on these systems. Thus, the project is monitoring the geographic expansion of the invasion and developing ecological experiments as well as educational, communication and management actions together environmental agencies, NGOs and civil society. The results showed that cup-coral caused tissue mortality of native coral species, changes on benthic assemblage structure and on ecological processes such as coral recruitment and fish herbivory and invertivory, changing the reef ecosystem functioning in BTS. Cup-coral recruitment was higher in areas with high invasive cover. Moreover, the foraging activities of the fish functional groups varied along the cup-coral gradient and bite rates were exponentially lower in areas with high invasive cover. This effect was strong on the Roving Herbivores (i.e. acanthurids and scarids) that avoided foraging on areas with high cup-coral cover. Monitoring also showed range expansion of cup-coral around the TSB, currently in 23 sites, both in estuarine (e.g. Paraguaçu estuary) and reefs systems including natural substrates such as coral reefs and rocky shores and artificial such as piers, shipwrecks, seawalls, nautical signs and oil platforms. In addition, our project assisted in the training of volunteers who worked on the manual removal of approximately 8000 colonies. Our project also has contributed to wide information dissemination about alien invasion problem to environmental public agencies, universities, civil society through technical texts, scientific, lectures, courses, and digital media. Finally, our project is assisting federal environmental agencies in the elaboration of the "Coral-Sol Plan" a management tool of the Brazilian Government that will be used to support monitoring, control, and prevention actions of the alien coral invasions along the Brazilian coast.

Key-words: CORAL REEFS CONSERVATION, SUN-CORAL, BAÍA DE TODOS OS SANTOS

POPULATION GENETICS OF SEA TURTLES ALONG THE BRAZILIAN COAST

Proietti MC[1], Secchi ER [1], Monteiro D[1,2], Marins LF [3], da Silva CPB[1], Reisser J[4]

1-Instituto de Oceanografia/FURG; 2-Núcleo de Educação e Monitoramento Ambiental; 3-Instituto de Ciências Biológicas/FURG; 4-The Ocean Cleanup/Holanda

Sea turtles are long-lived, highly migratory marine animals that occupy several habitats and ecological niches throughout their lives. The complexity of their life cycle and the large geographical/temporal scales involved require indirect research of their ecology and biology, for example through molecular analyses. These techniques can help elucidate aspects such as population structure, natal origins of animals at foraging grounds, migrations, and interspecific hybridization. In this work we studied the mitochondrial DNA of immature green (Chelonia mydas) and hawksbill (Eretmochelys imbricata) turtle aggregations along the coast of Brazil, in order to determine diversity, structure, and natal origins, and investigate hybridization between species. For juvenile green turtles in South Brazil, we found overall low genetic diversity, and lack of genetic structure relative to all other Brazilian feeding grounds except Almofala, in the northeast; however, they were genetically different from all aggregations in the Caribbean and North America. Green turtles feeding at the southern region originated mainly from international rookeries (Ascension and Aves Islands; ~70% contribution), but the Brazilian nesting ground at Trindade Island also contributes to the feeding aggregation in ~17%. We found that these contributions were generally correlated with surface ocean currents. Juvenile hawksbill turtle aggregations at seven sites from northeast to south Brazil presented medium genetic diversity. Genetic profiles of these feeding areas were significantly different from other regions in the Caribbean and Africa, and a significant structure was observed between Brazilian feeding grounds grouped into areas influenced by the South Equatorial/North Brazil Current and those influenced by the Brazil Current. Our genetic analysis estimates that the studied hawksbill feeding aggregations originate mostly from the domestic rookeries Bahia and Pipa, but some contributions from African and Caribbean rookeries were also observed. Origins were also generally correlated with ocean currents, reinforcing the influence of this oceanographic feature on turtle dispersal. Finally, we report immature hawksbill x loggerhead (Caretta caretta) hybrids at three areas: Ceará (n = 1), Bahia (n = 1) and Rio Grande do Sul (n = 6) states. Despite the unusually high frequency of hybridization events between hawksbill and loggerhead breeding groups is at the Bahia rookery, ours was the first record of immature hybrids at the coast, and contributes to a more thorough understanding of the fate of to these animals after being born at Bahia. These hybrids were not present in important hawksbill feeding grounds of Brazil, being detected only at areas more common for loggerheads. This could indicate that these immature hybrids, which are morphologically similar to hawksbills, could be adopting behavioral traits more similar to loggerheads. The information presented here highlights the importance of national conservation strategies and international cooperation for the recovery of endangered green and hawksbill turtle populations. We also highlight the significance of better understanding the distribution and ecology of sea turtle hybrids in order to develop adequate management plans for these animals.

Keywords: SEA TURTLES; CONSERVATION GENETICS; HYBRIDIZATION

ECOLOGY AND CONSERVATION OF THE ANTILLEAN MANATEE (TRICHECHUS MANATUS MANATUS) IN TIMONHA AND UBATUBA RIVERS, NORTHEASTERN BRAZIL

Meirelles ACO[1], Choi-Lima KF[1,2], Umezaki J[1], Santos HF[3], Claro PP[3], Wedekin LL[4], Sousa-Lima RS[5] Abessa DMS[2,6]

1-Associação de Pesquisa e Preservação de Ecossistemas Aquáticos; 2-Programa de Pós-Graduação em Ciências Marinhas Tropicais/Labomar/UFC; 3-APA Delta do Parnaíba/ICMBio; 4-Socioambiental Consultores Associados; 5-Departamento de Fisiologia, Universidade Federal do Rio Grande do Norte; 6-Instituto de Biociências, Universidade Estadual Paulista

The Antillean manatee is one of the most threatened aquatic mammals of Brazil. The species was hunted to extinction in the states of Espírito Santo, Bahia and Segipe, and now has a patchy distribution from the State of Alagoas to the State of Amapá. Due to its costal distribution, many human-caused impacts precluded the recovery of the Antillean manatee in Brazil. The detection of this species is difficult in estuarine waters, thus obtaining critical information about its populations is challenging. The goal of this study was to test active and passive acoustics methods of detection to estimate manatee's abundance and to identify which areas the species use within the estuaries of Timonha and Ubatuba rivers. Moreover, we tried to identify food items and human activities that threatens the species in these estuaries. The study area is located in the border of the States of Ceará and Piauí, and it is protected by the Environmental Protection Area (EPA) of Delta do Parnaíba. Data collection was conducted from a wooden boat with outboard motor using and side-scan sonar (Humminbird 998CX), and a hydrophone (HTI MIN-EXPORTABLE High Tech Ink®) connected to an audio digital recorder (MARANTZ® PMD661). Sonar images were collected along line transects (total of 35 km) in three regions within the study area, totaling 10 km2. After traversing the line transects, the boat stopped in known areas of manatees' occurrence to collect bioacoustics recordings. Kernel density was used to identify areas of occurrence and concentration of manatees, fishing activities and motor boats with software ArcGis 10.0 and Geospatial Modelling Environment (GME). From October 2012 to June 2014, a total of 21 field trips and 94 days of effort were conducted. We recorded 80 manatee groups during the field effort. The mean speed of the research boat was 2, 3 km/h and depth of detections ranged from 2 to 12 m (mean = 4,43 m). Sounds produced by manatees were masked by estuarine environmental noise and individual identification was not feasible. Area of usage by manatees was estimated to cover 2, 36 km2 while core areas covered 0,042 km2, located in the Carpina River, one of the three sampled regions. Maximum depth of this region was 5 m, and phanerogams, algaes, mangroves and salt marshes were available. Furthermore, fishing activities were not frequent, while motor boat traffic overlapped with the areas of use by manatees. Toxicological tests in sediments using microcrustaceans revealed the presence of contaminants in the region of Carpina River. Potential threats that were detected in this region were: boat traffic, fishing activities, shrimp farms and salterns. Our results suggest that the use of sidescan sonar associated with visual surveys is a viable technique to estimate the abundance of Antillean manatees in the study area. It is recommended that the zoning and management of EPA Delta do Parnaíba take into account the intense use of the Carpina River by manatees, with specific restrictions to boat traffic to avoid strikes and harassment of this endangered marine animal.

Key-words: SIRENIA, SIDE-SCAN, BIOACUSTICS

ANTHROPOGENIC AND SEASONAL DETERMINANTS OF GIANT OTTER SIGHTINGS ALONG WATERWAYS IN THE NORTHERN BRAZILIAN AMAZON

Michalski F[1,2]

1-Universidade Federal do Amapá; 2-Instituto Pró-Carnívoros

Human population growth and the associated anthropogenic effects have led to the disturbance of increasing numbers of animal habitats. The encroachment of human populations into increasingly remote areas has reduced the distance between humans and wild animals. Historic anthropogenic impacts affecting the distribution and ecology of Giant otters (Pteronura brasiliensis) are well documented, however little known regarding the factors is affecting the current distribution of this species. The size and piscivorous diet of Giant otters means that they are often involved in confrontations with humans. Our objective was to determine the relative importance of temporal (seasonal river levels), and anthropogenic (presence of houses, boats and fishing nets) factors on the distribution of Giant otters around a sustainable-use protected area in the eastern Brazilian Amazon. We collected data between March 2011 and June 2013 in the area surrounding the National Forest of Amapá (0°55'N, 51°35'W) on the Araguari and Falsino rivers. Our monthly diurnal river based surveys using a motorized boat at an average speed of 10.8 ± SD 2.8 km/h resulted in a total of 6836.1 km of boat surveys. This effort generated a total of 39 direct and 241 indirect Giant otter sightings along 198.9 km of waterways. To understand the importance of the seasonal and anthropogenic factors at different spatial scales we conducted analysis using data summarized at two spatial scales: 50 km river "zones" and 5.1 km river sections. Our results showed that anthropogenic disturbances were the most important determinants of the presence of both direct and indirect signs, with Giant otters rarely detected within 40 km of the nearest town. Giant otters were present in the waterways throughout the annual water cycle (high, decreasing, low and increasing river levels), with the number of riverside homes negatively associated with the number of direct and indirect Giant otter sightings. We also found that direct observations were positively related with the number of fishing nets present in the waterways. Our results suggest considerable spatial and temporal overlap between Giant otters and the activities of local fishermen which must be considered for the effective management of conservation conflicts in this rapidly developing region.

Key-Words: ANTHROPIC INFLUENCE; HUMAN-WILDLIFE CONFLICT; MUSTELIDAE

GUIANA DOLPHIN CONSERVATION, SOTALIA GUIANENSIS (VAN BÉNÉDEN, 1864), IN THE SOUTHERN ESPÍRITO SANTO STATE, BRAZIL.

Mamede N[1], Zerbini AN[1,2], Andriolo A[1,3]

1-Instituto Aqualie, Juiz de Fora - MG - Brasil; 2-The National Marine Mammal Laboratory, Alaska Fisheries Science Center, NMML/AFSC/NOAA, Estados Unidos.; 3-Universidade Federal de Juiz de Fora - MG – Brasil.

In Brazil, research with cetaceans has been intensified and the Guiana dolphin, Sotalia guianensis, has gained distinction because of the increasing number of studies regarding and such as its conservation's status. The Guiana dolphin's population that occurs in Benevente Bay in the southern state of Espirito Santo was chosen for this study due to lack of previous studies. Between 2012 and 2014 years, were applied methods which included a spatial-temporal scale. A total of 117 boat trips were made (472.4 hours), from January 2012 to November 2014. The application of photo-identification technique allowed the identification of 60 individuals. Most of photo-identified individuals were faithful to this area during this period and in various degrees of residence. Among individuals photo-identified there wasn't differences between the home range's sizes and the overlapping areas of life of individuals and sighted groups, was observed that the portion farther north Benevente Bay sampled area was most commonly used. The largest home range previously reported for this specie were recorded in this study. Mark-recapture method estimated abundances between 65 and 80 individuals. Guiana dolphin groups were sighted in all years and seasons, corresponding to 54.4 % of the effort days. On average, the groups were composed of eight individuals, and mostly we observed the presence of calves, as well as over all the years and seasons. Since the presence of calves were correlated to the increase in size of the groups. The observations of the behavior of the sighted group found that the most common behavioral state was foraging, followed by the displacement, socialization and resting. According to the method of the Minimum Polygon Convex, the Guiana dolphin's population vital area of the Benevente Bay corresponding to 60.2 km2. According to the Kernel method, the critical area corresponds to 12.6 km2 and the vital area to 54.0 km2. The species status was defined as vulnerable by the lists of Species of Brazilian Fauna Endangered in 2014, it occurrence near the coast, site fidelity, the presence of calves, and temporal budget displayed in the Benevente Bay were all indicators of the importance of this area. In this context, the size of this population associated with these conditions and locations anthropogenic threats identified become this population in a state of attention for possible management actions. The Guiana dolphin's population in the Benevente Bay is an important source of genetic diversity for the Management Unit of the Espírito Santo state. The connectivity to other locations is something to be highlighted and puts this population in a much broader conservation context. Besides this, due to the expansion of anthropogenic activities and the small number of studies with wild Guiana dolphin's populations in the Espírito Santo state coast, as others cetacean's species, one monitoring is priority, as well as its expansion on a spatial-temporal scale.

Keywords: SITE FIDELITY; VITAL AREAS; ABUNDANCE ESTIMATE.

DIVERSITY AND CONSERVATION OF POROID FUNGI (POLYPORALES) IN FRAGMENTED AREAS OF THE BRAZILIAN ATLANTIC FOREST

Motato-Vásquez V[1], Pires RM[1], Gugliotta AM[1]

1-Instituto de Botânica, Núcleo de Pesquisa em Micologia.

Brazilian Atlantic Forest is considered the second largest biome of the Neotropical region and one of the top-five biodiversity hotspots, supporting one of the highest degrees of species richness and rates of endemism on the planet, but has also undergone a huge forest loss due to excessive habitat fragmentation. This situation has severely affected many wood-dependent species. Most of the poroid fungi are predominantly xylophilous and play a fundamental role in the degradation of lignin, nutrient cycling and maintenance of terrestrial ecosystems. Although the conservation of fungal diversity is extremely important for ecosystems' health, biodiversity studies in the Neotropical region that deal with this group are few and it is completely unknown the impact of habitat degradation on these organisms. This project aims to conduct a preliminary inventory of poroid fungi diversity in fragments of Brazilian Atlantic Forest. To date, six of the 14 expeditions proposed were carried out in different Conservation Units of São Paulo and Rio de Janeiro states. The collected material was dried with air flow at 20-25 °C. The identification of species was based on the study of macroscopic and microscopic characters of the basidiomata, as well as the sequencing of the ITS (Internal Transcribed Spacer) (barcoding). To date, approximately 105 specimens were analyzed, distributed in about 54 species, 23 genera and five families. All specimens have been deposited in the herbarium SP, increasing the biological heritage of the Brazilian collections. This project also aims to promote the ex situ conservation of species obtaining pure cultures. We obtained, so far, 45 polisporic cultures which will be deposited in the Culture Collection of the Instituto de Botânica (CCIBt). Most specimens collected represent new records for the assessed localities and a new genus is being described based on morphological and molecular characteristics. The absence of taxonomic knowledge (species identity) is considered as a major concern for the conservation of fungi. Our results contribute to filling this gap and at the same time have stressed the importance of these studies as a solid basis for future research in phylogeny, education, ecology, conservation, among others. The results presented so far are partial and are part of an ongoing research project related to Polyporales order. Although our results should be considered preliminary, our sampling contributed significantly to increasing knowledge of the biodiversity of poroid fungi in the Brazilian Atlantic Forest.

Palavras-Chave: FUNGAL DIVERSITY; AGARICOMYCETES; BARCODING

CONSERVATION STRATEGY FOR CAATINGA HOWLER MONKEY (ALOUATTA ULULATA), NORTHEASTERN BRAZIL

Freire Filho ARG[1]

1-Faculdade de Ciências, Universidade de Lisboa

Alouatta ululata or Guariba da Caatinga is an endangered species and endemic of northeastern Brazil. This is part of the family Atelidae that represents the biggest Neotropical primates and it is composed by four genus Ateles, Brachyteles, Lagothrix e Alouatta. Caatinga Howler Monkey is a species understudied and its main threats are habitat loss and poaching. Its home range belongs to three Brazilian states, Ceará, Piauí and Maranhão. This range is inserted in two important Brazilians biome, Caatinga and Cerrado. The main object is identifying the more important areas to A. ululata conservation and propose conservation measures to the species. Therefore, will be built a potential distribution model taking into consideration the environment factors that influence the animals' distribution by Maxent. This model will identify the regions where there is suitable natural habitat to the species. The resultant model will be related with a cost layer (population density, the road-effect zone and anthropic areas), using the Zonation software, to identify which areas are more important to species conservation. The obtained results will allow identify what percentage of the most important areas to Guariba conservation inside existing Brazilian conservation units. The project will be developed in Northeastern Brazil, with two acting line: the first one in Northwest of Ceará state, inside of the Caatinga biome, in the humid enclaves. In this will be collected information about registers of the species in the enclaves. The object is identifying news distribution points of the species to build the distribution model by interview and check of the reports. The second study area is localized in North of Piauí, this region has a resultant phytophysiognomy of these three biomes Caatinga, Cerrado and Amazon. In this will be conducted interviews with local population to identify properties to develop a future project about behavior and ecology. The conservation strategies suggested by this project will go through three levels: (1) pubic sphere: to submit to the government the most important identified areas for Caatinga howler monkey conservation to raise awareness the rulers about the importance of maintaining these areas, and extends them where possible. (2) Community: conduct an awareness work with the population living in areas with suitable habitat for the species, to inform and educate residents about the importance of Guariba conservation by lectures in local community centers and schools, fixing posters and delivering T-shirts and hats. (3) Society: increase scientific knowledge and stimulate dialogue about the conservation of the species by the dissemination of the results of this study at universities and NGOs working in the conservation environment.

Key words: PRIMATE, MAXENT, INTERVIEW

MAMMAL DISTRIBUTION IN A LANDSCAPE WITH HIGH PERCENTAGE OF AGROFORESTS EXHIBITS WEAK RESPONSE TO DISTANCE OF REMAINING NATIVE FOREST

Ferreira AS[1], dos Santos SB[1], Cassano CR[1]

1-Universidade Estadual de Santa Cruz

Reconcile agricultural production and biodiversity conservation is a major challenge in the current century. Traditional cacao agroforests are wildlife-friendly systems that conciliate production and conservation in the same productive unit. The aim of our study was to analyze the importance of cacao agroforests for medium-sized mammal conservation in a landscape majorly composed (>60%) by the former system, in southern Bahia, Brazil. We used camera-traps to record medium and large-sized mammals in 15 agroforests. Agroforests were located at different distance from forest remnants (120 - 3000 m). Camera-traps were active in four 1-month surveys with weekly visits to exchange batteries and re-bait, between June 2013 and February 2015. Relative abundance index (RAI) was calculated for species and assemblage diversity was estimated (richness, 0D; exponential of Shannon's entropy, 1D; inverse Simpson concentration, 2D) in the sampling sites. Linear regressions were performed to test the effect of distance to forest on mammals' diversity in agroforests. Community structure in agroforests at three distance classes (>500 m; 1000-2000 and >2500 m) was visually compared with NMDS. We used an ANOSIM to test for distinct assemblages between agroforests at three distance classes. Thirteen species of wild mammals and four domestic mammals were recorded in our study sites. The most common species were the native Callithrix kuhlii, Canis familiaris (domestic dog), Cerdocyon thous and Procyon cancrivorus. The RAI of C. thous increased in agroforests far from forest remnants. Distance to forest did not influence diversity estimated by ^{0}D and ^{1}D, but was positively associated to ^{2}D, which reports the diversity of dominant species. Our study shows that cacao agroforests hold several medium and large-sized mammals independently of presence of native habitat in sampling site surroundings. However, mammal assemblages in our study region lack some forest specialists and game species. Probably, the big loss of forest in the landscape can be contributed to the loss of some species, mainly the specialists that depend on available resources strictly in forest. Agroforests at greater distance to forest are more likely to be used by common (and dominant) species. Agroforestry landscapes with high percentage of agroforest and few native forest remnants sustain an important subset of regional mammal species pool, including species threatened with extinction, but do not replace large forest tracts.

Palavras-Chave: MASTOFAUNA; LAND USE; LANDSCAPE

OCCUPANCY PATTERNS OF TERRESTRIAL MAMMALS IN RIPARIAN CORRIDORS IN A FRAGMENTED LANDSCAPE IN SOUTHERN AMAZONIA

Zimbres B[1], Peres CA[2], Machado RB[1]

1-Universidade de Brasília; 2-University of East Anglia

Species permanence in a fragmented landscape depends on habitat amount and connectivity, but a structurally connected landscape may not be functionally connected, depending on the circumstances in which the species travel through connecting elements. The success of ecological corridors as a management strategy will be intimately related to habitat structure, quality, context, and the species' tolerance to edge effects that dominate these patches. Riparian patches are legally protected in Brazil within private landholdings, and they are the best opportunity available to the integrated planning of an ecological corridor network that serves entire landscapes at both local and regional scales. In this work, we aimed to assess riparian corridor use in an occupancy modeling approach for terrestrial mammal species, assessing in what circumstances these species effectively use these connectors. We also extrapolated the occupancy patterns modeled for the entire study region, in order to identify which riparian remnants present the greatest potential to promote landscape connectivity for the community. We selected 38 riparian forest patches and five riparian sites within continuous forest, in which we installed four to five camera-traps (199 camera-trap stations). The terrestrial mammal community was sampled for 60 days per station during the dry seasons of 2013 and 2014. We modeled mammal occupancy and detection probabilities within riparian forest remnants, and examined the effects of corridor size, habitat quality, and landscape structure on their occupancy probabilities. Finally, we scaled-up the patterns modeled to 1,915 patches and generated a pseudo-richness map based on patch suitability according to a threshold of species occupancy. Of the ten species for which occupancy was modeled, only two did not present response to forest quality or structure (Hydrochoerus hydrochaeris and Dasypus novemcinctus). The studied landscape, although presenting a high level of structural connectivity, varies greatly in terms of functional connectivity for the different mammal species. Forest degradation was the most important determinant of occupancy probability, affecting six of the ten studied species. Patch suitability was lower when considering habitat quality than structure, and higher riparian forest quality was concentrated in the southwestern portion of the study region. Beyond safeguarding legal compliance, management such as the implementing of fencing and the protection of riparian patches against fire and illegal mining and logging activities will potentially have a huge influence in restoring and maintaining landscape connectivity for a wide range of terrestrial species.

Keywords: FOREST DEGRADATION; FUNCTIONAL CONNECTIVITY; SPATIAL ECOLOGY

SEEDING RECRUITMENT OF A KEY SPECIES ALONG AN ALTITUDINAL GRADIENT IN THE ATLANTIC FOREST: EFFECTS OF SEED DISPERSAL TIME, SEED ORIGIN AND RECRUITMENT SITE

de Souza AC[1], Portela RCQ[1], de Mattos EA[1]

1-Departamento de Ecologia, Universidade Federal do Rio de Janeiro (UFRJ), CEP: 21.941-902, Rio de Janeiro-RJ, Brasil. Email: cs.aline@gmail.com

Seed germination and seedling establishment are critical life stages subject to a strong selection pressure, influencing the distribution and persistence of plant populations. Many ecological factors can limit seedling recruitment, such as herbivory, drought, temperature, and seed predation. Local adaptation in the early life stages improves the success of seedling recruitment, which may allow the persistence of populations in environments with unfavorable environmental conditions. The timing of life-cycle events is extremely important to a successful growth, survival and reproduction. Seed dispersal time determines the environmental conditions encountered by the seed, and consequently the geographic distribution of species, since successful seed germination and seedling emergence constitute the first steps in the life cycle that allows the colonization of a new area and persistence of the species. The palm Euterpe edulis represents a good model to increase our understanding of local adaptation and the effects of seed dispersal time on seedling establishment. This species has a wide distribution range in Brazil and is considered a keystone species in the Atlantic Forest hotspot. Many local populations of this palm have been reduced or even become extinct, with large populations being now restricted only to protected areas. A good understanding of how seed germination and seed establishment are influenced by abiotic and biotic factors is crucial to conservation and restoration of this endangered species. We studied two populations of E. edulis that occur in different altitudes (300 and 1200m), with different seed dispersal phenologies. The climate at high altitude is characterized by lower temperatures and higher precipitation when compared to climatic conditions at low altitude, providing a higher soil water availability along the year for seedling establishment. The aims of this study were: 1) To evaluate if local adaptation contributes to a higher seedling establishment; 2) To evaluate if seed dispersal time influences seedling establishment. Our results indicate that the two populations of E. edulis are not locally adapted in the early life stages, as both populations responded similarly in terms of seedling establishment at the two altitudes. The better performance of both populations at high altitude was related to a higher soil water availability during almost the entire year, resulting in a higher seedling establishment. Seed dispersal time had no effect on seedling establishment at high altitude. However, at low altitude, seedling establishment was lowest when seeds were dispersed at the end of the rainy season. Thus, we can assume that the shorter seed dispersal time in E. edulis at low altitude, is probably associated with a higher seasonality of the environment at this site, particularly regarding the soil water availability, decreasing the exposure of seeds and seedlings to dry conditions. We can expect that the short-term response of E. edulis to changing climatic conditions will be migration to higher altitudes, in order to track favorable climatic conditions, considering the absence of local adaptation in studied populations. Moreover, climate change may alter seed dispersal phenology, resulting in negative impacts on seedling establishment, especially at the population of E. edulis located at low altitude.

Key words: SEEDLING RECRUITMENT, LOCAL ADAPTATION, SEED DISPERSAL TIME

WHAT LANDSCAPE FEATURES SUPPORT THE PERSISTENCE OF BAT POPULATIONS IN A FRAGMENTED AMAZON?

Martins ACM[1], Willig MR[2], Steven JP[2], Marinho-Filho J[1,3]

1-Graduate Program in Ecology, University of Brasilia, Brazil; 2-Center for Environmental Sciences & Engineering and Department of Ecology & Evolutionary Biology, University of Connecticut, Storrs, CT, USA, 3-Department of Zoology, University of Brasilia, Brazil. E-mail: martins79.ana@gmail.com.

The degradation in the tropics has reduced forest extent, creating deforested and fragmented landscapes. These changes in landscape cause many adjustments in the distribution, abundance, and ability of each species to persist. Because seed dispersers, pollinators, or top predators, such as bats, contribute to the structure and function of forests, they deserve particular attention, as they directly affect forest integrity. Thus, understanding how the abundances of bats are affected by variation in landscape characteristics is needed to inform management and conservation action. To do so, bats were collected at each of 24 sites in the southern Brazilian Amazon (96 nights, 8640 m2-h per site), and landscape metrics were quantified for each as well. Responses to landscape features were detected for fourteen populations of phyllostomids along an environmental gradient of forest loss. We used a hierarchical approach to model selection based on Akaike information criteria (AIC) to identify characteristics (i.e., forest patch size; forest amount; habitat, matrix or landscape characteristics) to indentify landscape features to which bat species are most sensitive. This approach was employed at five spatial scales (i.e., circles of 1, 2, 3, 4 and 5 km radius), because bat species differ in home range size and foraging strategies. Species abundances were analyzed using generalized linear mixed-effect models (GLMERs). Bats evinced species-specific responses to landscape characteristics. Canopy frugivores were affected by habitat and matrix characteristics at different spatial scales. Artibeus lituratus did not require large amounts of forest amount at intermediate scales (2, 3 and 4 km), but had positive associations with landscape diversity at those same scales. A. planirostris evinced higher abundance in association with matrix amount (all scales) and to environmental heterogeneity; and A. obscurus was more abundant at local sites dominated by forest, surrounded by a less forested landscape. All other bat species were not associated positively with habitat metrics at a local scale. Glossophaga soricina, a nectarivore that provides a key ecosystem function, preferred more heterogeneous landscapes at local scale, with negative associations to matrix amount (2 km) and forest isolation (3 km). Lophostoma silvicola, a predator of arthropods, is associated with landscape features only at a 5 km scale, with abundance associated with amount of matrix and shrub vegetation. Finally, some understory frugivorous (e.g., Carollia brevicauda) were more abundant in habitats with little forest cover (all scales), with low isolation levels whereas C. perspicillata was associated negatively with habitat metrics at small to intermediate scales (1-3 km) but with higher abundances at sites containing large forest patches at larger scales (4-5 km). In conclusion, some bats were highly sensitive to deforestation (A. obscurus, Rhinophylla fischerae, G. soricina) whereas others were not (A. lituratus, C. brevicauda. C. perspicillata), with responses to landscape structure varying among species and with spatial scale. Such information critically informs land management decisions by stakeholders and land owners, and should be considered in conservation policy as well.

THE COLLAPSE OF WHITE-LIPPED PECCARY POPULATIONS IN CONTINUOUS AREAS OF ATLANTIC FOREST

Norris D[1]

1-Universidade Federal do Amapá

White-lipped peccaries (Tayassu pecari) are declining throughout South America as a result of hunting and habitat loss. They are one of the first species to disappear with the advance of humans as they i) are a preferred target for hunters, ii) require large areas. Peccaries are threatened in the state of Sao Paulo due to more than 300 years of intense hunting and deforestation and now the majority (>99%) of forest areas are too small to sustain populations. Therefore, there is an urgent need to understand anthropogenic and environmental influences on the remaining populations within areas of Atlantic Forest. There are areas of the Brazilian Atlantic Forest that should maintain large populations of peccaries. However, previous studies suggest high abundances in one region (Serra-do-Mar) and low (perhaps ecologically extinct) in another (Paranapiacaba). Surveys of mid- to large bodied mammals took place in two protected Atlantic Forest areas in the State of São Paulo, Brazil: Núcleo Caraguatatuba, of the Serra do Mar State Park and Intervales State park. After 88 days, 594 kilometers of census, 223 camera-trap days and 867 track-station days I obtained 406 detections of 19 mammal species. Yet, there was only 1 location where white-lipped peccary had passed in Núcleo Caraguatatuba. And there was no sign of white-lipped peccary in Intervales. This results means that I confirmed the presence of only 1 group across both the areas studied (a total of 78 837 hectares or 788 square kilometers) of Atlantic Forest. Previous studies in the Amazon forest estimate that peccaries range over an area of between 60 – 140 km2 (Peru), in areas of Brazilian Cerrado (a type of savannah) home ranges were 14 to 288 km2, and in a fragment of Atlantic Forest 20 km2. The area used by different groups also overlaps. Therefore, if: 1) populations were healthy and 2) the habitat was suitable I would expect there to be a total of somewhere between 13 (60 km2 home-range) and 39 (20 km2 home-range) groups of peccaries in both the areas studied. So, as I was able to find only 1 location, I can only conclude that white-lipped peccaries are ecologically extinct (i.e. so rare that they no longer perform their vital ecological functions that maintain forest biodiversity) in the areas studied. Although previous studies suggest protected areas as the principal option to conserve peccaries, my results add to the growing body of results that suggest more specific and direct actions (e.g. reintroduction) will be necessary for the long term conservation of the species in the Brazilian Atlantic Forest.

Key-Words: PROTECTED AREA MANAGEMENT; SPECIES VULNERABILITY

INSTALLATION OF ARTIFICIAL NESTS AS A STRATEGY FOR THE CONSERVATION OF THE RED-TAILED PARROT (AMAZONA BRASILIENSIS)

Sipinski EAB[1], Abbud MC[1], Sezerban RM[1]

1-Sociedade de Pesquisa em Vida Selvagem e Educação Ambiental – SPVS

The Red-tailed Parrot (Amazona brasiliensis) is an endemic species to the Brazilian coastal plain, which spans between the southern coasts of the State of São Paulo up to the border of the State of Santa Catarina. The region also contains The Estuarine Lagoon Complex (Lagamar), considered to be the most important contiguous remnant of the Atlantic Rainforest biome in southern Brazil. The current population of the Red-tailed Parrot is estimated to be 8,380 individuals in the entire area of occurrence (2016 Census, SPVS), of which approximately 80% of the population is located in conservation units in the northern part of the State of Paraná. The Wildlife Research and Environmental Education Society (SPVS) is a nonprofit organization founded in 1984, working for nature conservation. In 1998, SPVS started the Conservation of the Red-tailed Amazon Parrot project on the coast of the State of Paraná. Since 2013, actions have expanded to the southern coast of the State of São Paulo, now covering the entire current area of occurrence of the species. In order to minimize the threats to the species and its habitat, the project has concentrated its efforts on the protection of breeding sites, monitoring and management activities, conservation education and the integration of local influencers. SPVS's strategies are based on the National Action Plan for the Conservation of Parrots, coordinated by CEMAVE (National Research Center for the Conservation of Wild Birds). One of the primary contributions to the conservation of the species and its habitat has been through the protection and management of breeding sites located on islands off the coast of the State of Paraná. From 1998 to 2009, about 120 natural Red-tailed Parrot nests were registered and it was found that approximately 85% of the natural nests recorded were lost. However, the deficit of nests was suppressed by the gradual installation of artificial nests to replace the lost natural nests. The main causes of the destruction of natural nests were climatic factors that led many trees to fall and rot, theft of chicks and the excessive extraction of forest trees. In 2003, the project team installed 15 artificial wood nests, experimentally, near the lost natural nests. After verifying the effectiveness of these wooden nests, PVC artificial nests were made. Currently the project monitors 130 artificial nests in wood and PVC, with an average occupancy rate and reproductive success above 60%. Thus, it can be concluded that the installation of artificial nests is a strategy that has provided conditions for the reproduction of the species. It provides conditions to raise the proportion of couples who occupy the nests in the breeding season and contributes significantly to the increase of the population in the region.

Key-words: RED-TAILED PARROT, ARTIFICIAL NESTS, ATLANTIC FOREST

ANTHROPIC INFLUENCE ON THE OCCUPATION PROBABILITY OF CARNIVORES IN THE CAATINGA BIOME, NORTHEASTERN BRAZIL

Dias DM[1], Rodrigues FHG[1], de Campos CB[2]

1-Post-graduation program in Ecology, Conservation and Wildlife Management, Federal University of Minas Gerais; 2-Institute for the Conservation of Neotropical Carnivores-Pro-Carnivores

The loss and modification of habitats related directly or indirectly to human activities pose a serious threat to mammalian populations worldwide. In Brazil, the anthropic activities in general play a role contrary to biodiversity conservation because of the several impacts imposed on the species and their habitats. Although many mammals, especially carnivores, have developed adaptations to live in heterogeneous environments, human population growth and consequent demand for natural resources has changed landscapes and decreased the availability of natural prey. Some carnivores are considered especially vulnerable due to biological attributes, such as low reproductive rates and densities. In addition, the habitat loss arising from anthropogenic activities also makes this group in a vulnerable situation. With the information that will be collected in this study will make it possible to understand the distribution of carnivores in relation to environmental conditions and how the species are responding to anthropic impacts. The study will be conducted in the region known as Boqueirão da Onça, located in the North of Bahia State, northeastern Brazil. With an area of approximately one million hectares. Camera-trap system - It will be used 60 traps, fitted with motion sensors, installed in independent sampling stations, answering to a minimum distance of 2 km between each station. The traps will be in the field for 12 months and the sampling effort will be determined by multiplying the number of traps by the number of days of exposure. As anthropic variables, it will be considered the land use (remote area, extensive livestock, wind farms) and the distance to the nearest human settlement. As environmental variables, it will be included the type of habitat (areas in the early stages of succession, dense shrub arboreal caatinga), elevation and distance to the nearest point of permanent water. For the understanding of the connection between species of mammals and habitat will be used the occupancy probability modeling. The model can correct errors of detectability, which generate false absences (not detecting when the species is present). Through a history of detections in each sampling station, the model estimated the probability of occupation (Ψ) as well as the probability of detection (p) in each sampling unit. Occupation models will be built with influence of the covariates to each species. Choosing the best model will be made based on Akaike Information Criterion (AIC). With the goal to contribute to the expansion of knowledge about the biodiversity of the Caatinga and stimulate research in this region, this study aims to achieve the following results in goals: Identify the human activities that affect negatively the mammals in the study area. Identify critical areas for conservation of mammals in the region of Boqueirão da Onça; propose a criterion for selection of areas for the establishment of large enterprises under the Caatinga biome, based on the results obtained; contribute to future action plans for species threatened with extinction; provide information on the ecology of mammals of the Caatinga and give subsidies for subsequent studies in the biome.

VULNERABILITY OF HIGH ALTITUDE GRASSLANDS TO DROUGHT EVENTS

Matos IS[1], Rosado BHP[1]

1-State University of Rio de Janeiro - UERJ, Laboratory of Plant Ecology

Global warming is causing changes in precipitation patterns, enhancing the intensity, frequency and duration of drought events worldwide. Under drier conditions, plants can rely on atmospheric sources of water, such as fog, to improve their water status. Recent studies have found that water in the fog can be absorbed by the leaves and redistributed to other parts of the plant, rehydrating their tissues. The ability to perform leaf water uptake (LWU) might be especially important for vegetations in high altitude environments where fog events are common. However, due to an increase in the average height of cloud formation, it is predict that the atmosphere of mountains regions will become drier. Reductions in both atmospheric and soil water availability can lead species to surpass their thresholds of drought resistance and resilience and profoundly affect the structure and functioning of plant communities. To assess the degree of vulnerability of high altitude vegetation to drier conditions we measured seven morphological traits linked to water use in a set of 67 plant species from the Itatiaia National Park (2,500 m asl, southeastern of Brazil). We also performed laboratorial experiments to assess the ability of those species to perform LWU and the short-term effects of LWU on plant water status. Through a principal coordinate analysis we identify three functional groups of response to drought: i. tolerant species characterized by the presence of dense wood, dense leaves and high values of leaf dry matter content; ii. Water storing species that showed larger and thicker leaves, and higher values of leaf succulence; and iii. Fog absorbing species characterized by tender leaves with high LWU. It was observed a relationship between those groups and the three plant ecological strategies proposed by the CSR triangle theory. So that, the water storing group was mainly composed by competitors species (C); the tolerant group by stress-tolerators (S) and the water absorving group by ruderal (R). All evaluated species were able to perform LWU when subjected to drought, and that ability had significative short-term effects on plant water status, enhancing the leaf water potential and the stomatal conductance. However, only the ruderal species were able to return to their initial leaf water potentials after the LWU. Those preliminary results indicate that most of the species in the high altitude grassland are stress-tolerators and potentially would resist to drier conditions. Nevertheless, the ruderal species (fog absorbing group) are likely to be affected by drier conditions on atmosphere and on soil, since those species depends on fog to tissue rehydration during drought events. A rainout field experiment combined with dominant plant species removal is being performed to evaluate if positive plant-plant interactions could buffer drought effects at community level, allowing the persistence and/or favoring the return of these subordinate and less-tolerant species. At the end, besides the identification of the most vulnerable species, it will be possible to predict compositional changes, and to propose more effective actions to minimize the negative effects caused by extreme drought events on plant community structure and functioning.

Key words: FUNCTIONAL ECOLOGY; LEAF WATER UPTAKE; CSR TRIANGLE THEORY

THE IMPORTANCE OF KEYSTONE RESOURCES IN HIGH-PRODUCTIVITY ECOSYSTEMS: EXPERIMENTAL TESTS WITH SMALL RODENTS

Prevedello JA[1], Vieira MV[1], Vieira EM[2], Dickman CR[3]

1-Departamento de Ecologia, CP 68020, Universidade Federal do Rio de Janeiro, Rio de Janeiro, 21941-590; 2-Departamento de Ecologia, Universidade de Brasília, Brasília, Brazil; 3-School of Life and Environmental Sciences, University of Sydney, Sydney, New South Wales, Australia. E-mail: ja_prevedello@yahoo.com.br

Food availability is considered to be a primary factor affecting animal populations, yet few experimental tests have been performed to evaluate its actual importance in species-rich ecosystems such as rainforests. It has been suggested that in such systems certain plant species may act as "keystone" resources for animals, but the importance of presumed keystone resources for populations has not been quantified experimentally. Using complementary seed removal and seed-addition experiments, we determined how the supply of a presumed keystone resource, seeds of Araucaria angustifolia, affects short-term demography of their main consumer group (small rodents) in a biodiversity hotspot, the Brazilian Atlantic Forest. Araucaria angustifolia seeds fulfill, a priori, all the requirements of a keystone plant resource, including consumption by a large proportion of the vertebrate community, high availability during a period of overall food shortage (autumn–winter), and reliability (they are produced every year). About 3400 tons of A. angustifolia seeds are harvested annually for human consumption and trade, with potential impacts on animals that are still unknown. We hypothesized that (i) the harvest of A. angustifolia seeds by human populations has negative impacts on rodents, and (ii) these seeds are a limiting resource for rodent populations. To test these hypotheses, we monitored populations of two species of numerically dominant rodents (Delomys dorsalis and Akodon montensis) within replicated control-experimental plots. Manipulations of seed supply over 2 years had little effect on population size, body condition, survival, or reproduction of the two rodents, suggesting that, in the short-term (within one generation), their populations are not food limited in Araucaria forests. Despite apparently having all the characteristics of a keystone resource, as currently defined in the literature, the seeds of A. angustifolia had limited influence on the short-term demography of their main consumer group. Our experiments suggest that, in situations where purported keystone resources are seasonally abundant, their actual importance may be lower than generally assumed, and these resources then may have only localized and temporary effects on consumer populations. Our results also suggest that seed harvest by human populations has little impact on rodents, as long as traditional harvest techniques are used. This means collecting seeds mostly from the forest floor, by small groups of people, in small harvest areas embedded within larger forest remnants. Unfortunately, this situation is likely to be rare, as 79% of the currently remaining Araucaria forest fragments are smaller than 50 ha, and 97% of these are located outside reserves.

Keywords: ARAUCARIA FOREST, SEED HARVESTING, NON-TIMBER PRODUCTS

HUMAN CHRONIC DISTURBANCES AND THEIR MULTIPLE ECOLOGICAL EFFECTS ON CAATINGA WOODY FLORA

Ribeiro EMS[1]

1-Programa de Pós-Graduação em Botânica, Departamento de Botânica, Universidade Federal de Pernambuco, Av. Professor Moraes Rego s/n, Cidade Universitária, CEP: 50670-901, Recife, PE, Brasil. E-mail: nanigesbio@yahoo.com.br

Chronic anthropogenic disturbances (e.g. harvesting of timber and non-timber forest products, hunting, and livestock in natural remnant forests) are common in developing countries, where rural and traditional human populations use forest resources for subsistence. The Brazilian Caatinga is a seasonal tropical dry forest where these chronic disturbances are frequent but their consequences to biodiversity are poorly investigated, which limit our ability to propose management strategies in order to conciliate the local biodiversity and the use of natural resources. In this sense, in 2011 I initiated a study which aimed to answer how these chronic disturbances affect the diversity of woody plants in distinct ontogenetic stages (seedlings, saplings and adults), addressing the taxonomic, phylogenetic and functional diversity levels. The density of people and livestock (goats and cattle) near the surveyed plots were used as predictors of chronic disturbance, as well as the distances to the nearest urban centre, road and rural property. In general, these disturbance predictors showed negative effects on taxonomic, phylogenetic and functional diversity irrespective to ontogenetic stage. Sites with more influence of these chronic disturbance indicators presented more close related species, which also has attributes as low leaf mass per area and wood density. These results demonstrate that chronic anthropogenic disturbance in Caatinga could not continue to be neglected, as it imposes deleterious effects to the taxonomic, phylogenetic and functional diversity of woody plant assemblages. Moreover, this loss of biodiversity menaces the continuity of natural resources use by local populations in the future and the provision regulating ecosystem services as climate control by carbon storage and biomass productivity in dry forests.

Key-words:

BIOACOUSTICS RESEARCH ON GOLDEN BACKED UAKARIS (CACAJAO MELANOCEPHALUS) AND BLONDE CAPUCHIN MONKEYS (SAPAJUS FLAVIUS)

Bezerra BM[1]

1-Universidade Federal de Pernambuco, Department of Zoology. Email: bruna.bezerra@ufpe.br

Here I will summarize results from studies conducted on the acoustics of golden backed uakaris and blonde capuchin monkeys, studies funded by Rufford Small Conservation Grants. Uakari studies were conducted at Jaú National Park, Amazonas, Brazil. The area has 2,272,000 ha. Studies on blonde capuchins were conducted at private owned Atlantic forest fragments at Paraíba (936 ha) and Pernambuco (400 ha), also in Brazil. The animals were recorded with a Sennheiser ME-67 microphone (frequency response: 40 Hz - 20 kHz ± 2.5 dB) connected to a Marantz PMD-670 recorder (frequency response: 20 Hz - 20 kHz ± 2 dBu, 16 bit quantization and 48kHz sampling rate). Maximum recording distance was 15m. For playback experiments, it was used a SME-AFS amplified field speaker (Saul Mineroff Eletronics; frequency response: 100 Hz to 15 kHz ± 2 dB). Golden-backed uakaris showed nine calls in their vocal repertoire, with some calls specific to the animal's age and behavioural context. Data from three social groups were obtained in 2007 and 2008. Call structure also varied according to the behavioural context and individual caller. Call playback elicited a vocal response on uakaris, showing the potential of using playbacks in surveys. Information on caller distance may be encoded in the structure of certain calls and these calls may be adapted for efficient transmission in the uakary's natural habitat. Blonde capuchins showed twenty-nine calls in their repertoire, and also had calls that were context and age specifics. Data were collected in 2011 e 2012. The blonde capuchins also produced vocal responses to call playbacks. Repertoire size reflected social group sizes in these species. The data summarized here resulted from collaborations with researchers in Brazil, USA and England. Data collected in these projects resulted in a PhD thesis, an MSc dissertation, a monograph, several journal papers and information being used for both species conservation.

Key words: NEOTROPICAL PRIMATES; VOCALISATIONS; CONSERVATION.

SPONGIVORY BY FISHES (POMACANTHIDAE FAMILY) ON CORAL REEFS OF TODOS OS SANTOS BAY

Lorders FL[1], Nunes JACC[1], Miranda RJ[1], Barros F[1]

1-Laboratório de Ecologia Bentônica (LEB), Instituto de Biologia, Universidade Federal da Bahia. Rua Barão de Geremoabo, s./n., Ondina, 40170-115, Salvador, BA, Brasil. Email: nandalorders@gmail.com

In marine systems, it is well known that predator-prey interaction can affect assemblage's structure and ecosystem functions, and shape prey distribution at different habitats. Within reef environments, sponges are sessile organisms, quite diverse, widely found with large biomass in different marine systems, being thus potentially a good model to evaluate predator-prey interactions. Sponges are an abundant group and perform relevant ecological functions such as nutrient and energy cycling and water purification, also they serve as food for trophic levels more elevated (e.g. fishes). Generally sponges are considered superior competitors for space then corals, essentially due to their defense strategies, including physical (spicules) and chemical (secondary metabolites). Sponges can negatively affect the recruitment and growth of coral reef builders and coral reefs processes, but these effects can be indirectly attenuated by fish predation on sponges. Sponge predation or spongivore is mainly performed by angelfishes (family Pomacanthidae), in which eating predominantly sponges (e.g. Pomacanthus arcuatus, Pomacanthus paru and Holacanthus ciliaris). In higher diversity coral reefs, such as Caribbean reefs, top-down regulation by fish plays a decisive role on growth of different sponge's species, consequently affecting benthic assemblages. Brazilian coral reefs have relatively low coral fauna diversity, high sedimentation rates and elevated turbidity due to several rivers flow into shore, condition considered marginal for their optimal growth. Nevertheless, spongivorous fishes control over sponge assemblages was never evaluated. The goals of the present study were to assess if spongivorous predation can influences the sponge assemblages structure in marginal coral reefs and analyze its potential influences on builder corals assemblages. Thus, we investigated whether there would be a relationship between spongivorous fish density and coverage of sponges on Todos os Santos Bay (TSB) coral reefs and if spongivorous density and the number of coral–sponge contacts would be related. Additionally, we evaluated sponge preferences during spongivorous fishes foraging. The study was carried out at inside section of Todos os Santos Bay (TSB) by SCUBA dive. Data survey was realized by sponge and spongivorous census and benthic photo quadrat. The photo was analyzed through software CPCe also allow count number of coral-building encounter. The foraging activity was measured by feeding rates (bites per minute) of spongivorous fishes obtained by animal focal method. For to test the hypotheses Spearman correlation coefficients were calculated to evaluate the relationship between spongivorous fishes density with sponge cover and with number of sponge-coral interactions with their confidence intervals at 95%, multiple regression using stepwise model selection method were conducted to evaluate the relation of each spongivorous species density and their interactions with eight sponge species cover. The Ivlev's Electivity Index was calculated to identify potential spongivorous fish feeding preference for different sponges. There was no significant relationship between sponge density and general sponge coverage (r = 0.32, p = 0.3), however there was a significant relationship between the coverage of Pomacanthus arcuatus and Sacopalina ruetzleri (p <0.01). The increase of spongivores density not reflected in decrease of coral-building and sponge's interections number, the number of encounter was strongly related to coral coverage, demonstrating relation with the integrity of the reef. Desmapsamma anchorata was sponge with the highest interactions frequency with corals (36%), as well as the sponge with the highest coverage among reefs sampled (3.8 ± 0.79). The spongivores selected four species of sponges (D. anchorata, Aplysina cauliformis, S. ruetzleri and Niphates erecta), palatable and with high level of chemical defense, being P. arcuatus, the most abundant spongivorous in BTS, showed to be the most generalist, selected all sponges mentioned above. This study presents important reflections on spongivorous x sponge's relationship, such as environmental conditions (e.g. sedimentation) and anthropic impacts, in which may be influencing top-down control in marginal coral reefs.

Key-words: SPONGIVORY; PORIFERA; CORAL REEFS

EVALUATION OF THE STATE OF CONSERVATION OF THE ENDEMIC CORAL MUSSISMILIA HARTTII (VERRILL, 1868) (CNIDARIA: ANTHOZOA) IN BRAZIL

Pérez CD[1]

1-Centro Academico de Vitoria, Universidade Federal de Pernambuco

Coral reefs are considered one of the most endangered ecosystems today, which are highly susceptible to natural stresses and direct and indirect anthropogenic impacts. However, the knowledge of these ecosystems, their distribution, their state of health and the ecological interactions that rule them, are still rudely known. Brazilian coral reefs present a rich endemic fauna of constructing corals and the main species belong to the endemic genus Mussismilia. Mussismilia harttii was once one of the most abundant species in Brazilian reefs occurring along the coast from Rio Grande do Norte to Espirito Santo States. However, since the 1960s, there has been a decline of this species, and now is clear the reduction of the populations, but to date, any studies showing this decline are scarce or nonexistent. Its current state of conservation in the International Union for Conservation of Nature (IUCN) database is listed as "Insufficient Data". In order to evaluate the conservation status of M. harttii, this study presents quantitatively the criteria related to population trends, population size and structure, and geographic distribution of the species. These data were obtained through a bibliographical review and the use of ReefCheck methodology adapted to Brazilian reefs. Abiotic data, sediment samples for particle size and organic matter analysis were collected. Annual growth rates, calcification and density of corallites collected from live and dead colonies were analyzed. The results presented here show the decline of the M. harttii populations in all the reef environments analyzed here (Paraíba, Pernambuco, Alagoas and Bahia) with the presence of extensive cemeteries, with densities of up to 33 corallites / m². Abiotic data, sediment granulometry and organic matter analysis were collected. Annual growth rates, calcification and density of corallites collected from live and dead colonies were analyzed. The results presented here show the decline of M. harttii populations in all the reef analyzed here (Paraíba, Pernambuco, Alagoas and Bahia) with the presence of extensive cemeteries, with densities of up to 33 corallites / m². All the reefs present damaged colonies, that is, covered with algae or dead polyps. Our results conclude that populations on the Paraíba and Pernambuco reefs are weakened in health status and are affected mainly by fine sediments, acid pH, a high human construction rate in the supralittoral band and a high tourism index. The reefs of Bahia and Alagoas present better conditions for the state of health. The determination of the conservation status of M. harttii populations in the study sites was based on the criteria required by the IUCN, and as a result it is recommended to include the status of "Vulnerable" in the Red List of Threatened Species, and the implementation of short and long-term monitoring programs, which includes emergency actions for the recovery and maintenance of populations.

Key-words:

FUNCTIONAL TRAIT APPROACHES TO UNDERSTAND ECOLOGICAL PROCESSES OF PALM SPECIES ALONG AN ALTITUDINAL VARIATION GRADIENT IN THREATENED BRAZILIAN ATLANTIC FOREST

Colmenares-T SL[1], Nettesheim FC[1], Portela RCQ[1], Guedes-Braz MI[1], Pires AS[2], de Mattos EA[1]

1-Universidade Federal do Rio de Janeiro; 2-Universidade Federal Rural do Rio de Janeiro.

Our aim was to determine the contribution of niche and neutral-related processes to explain altitudinal variation trends of an Atlantic Forest palm assemblage composed by 12 taxa differently distributed from 0 to 1400 m.a.s.l. The community richness variation exhibits a hump-shaped distribution, where intermediate altitudes are the richest. At first, we made an ordination based variation partitioning, which allows to assess the relative contribution of environmental and spatially structured factors on community assembly. Partitioning procedures offer a set of environmental and spatial fractions that can be associated to niche and neutral processes. The final complete dbRDA model explained 35.3% of total palm assemblage variation (P<0.05). Pure habitat [E] explained 17.4%, pure linear spatial structure [SL] explained 4.4% and pure refined spatial structure explained [SR] 1.5%. Pure environment combined with spatially structured environment explained 27%, while pure linear and refined spatial structures combined with the spatially structured space [pure SL, pure SR and SL ∩ SR] explained 8.2%. Final model was composed by soil factors Silt, Phosphorous, quadratic clay and quadratic sand, as well as geographical coordinates (X, Y), and the first vector from refined spatial structure represented by distance based Moran Eigenvector Maps (PCNM1). The total proportion of explained variation from environmental-related fractions suggested that the altitudinal variation of the palm assemblage was strongly influenced by species–environment relationships associated with local soil conditions and topography, in spite of some variation can be derived from spurious environmental factors. Alternatively, the contribution from the spatial structure to explain community assembly was almost three times smaller than from the environment, suggesting that stochastic processes had little influence over the structure of this tropical palm assemblage. Following this, we calculated functional diversity components for the community at five elevational belts and the community weighed mean for each trait at each elevational point. We found that at lower belts (from 0 to 800) the community follows a different pattern than in the higher belts (from 800 to 1400). To identify the causes of this functional differences, we made an ordination based variation partitioning for the two areas, high and low belts. The final complete dbRDA model for higher areas explained 61.4% of total palm assemblage variation (P<0.05), but pure habitat [E] explained only 1.7%. The pure linear spatial structure [SL] and pure refined spatial structure were also small [SR], were also negligible, explaining only 0.1% and 0.6%, respectively. The final complete dbRDA model for lower areas explained 39.2% of total palm assemblage variation (P<0.05), being that pure habitat [E] explained 18.5%, pure linear spatial structure [SL] explained 6.1% and pure refined spatial structure explained [SR] 1.3%. Those results suggested that niche processes are more important at lower areas while at higher elevation spurious or stochastic processes, like dispersal limitations or environmental factors out of our scope, are determining the species distribution and community functional responses.

Key words: NICHE; VARIATION PARTITIONING; ASSEMBLY.

THE LITTLE HUGE BARRA MARINE PARK IN SALVADOR

Barros F[1], Reis A[1], Miranda RJ[1], Nunes JACC[1], Lorders FL[1], Costa Y[1], Carvalho L[1], Tourinho L[1], Mussi G[1], Cruz ICS[2], Torres R[2], Rodrigues J[2], Mussi B[2]

1-Universidade Federal da Bahia; 2-Grupo de Trabalho Parque Marinho da Barra

A brief historic and the rationale for the creation of the first marine park (Barra Marine Park, BMP) in one of the largest cities in Brazil is present. BMP is located in Todos os Santos Bay, the second largest bay in Brazil, with several anthropogenic activities influencing the environmental quality of different sectors of this bay. We argue that there are four important aspects to be considered in the implementation of marine parks: precautionary principle (potential errors in favor of the environment), different impressions of science (good, bad and ugly science), the need for urgent decisions (environmental trials) and factors (other than science) affecting environmental decision-making. We contextualized the current environmental global crisis in and ecological resilience showing examples of anthropogenic pressures around BMP. Particularly we present well-documented cases of negative impacts of invasive species and phase shift in the region. We show some of the key features for successfully implement marine protected areas and discuss how BMP can easily reach some of them (not take, well forced and age). We also discuss different values as motivators of creation of marine protected areas. We show how academics and other stakeholders got enthusiastic and involved with the BMP, the current actions in order to implement the BMP and how relatively small protect areas can have huge potential benefits.

Key words: URBAN MARINE PARK; MARINE CONSERVATION

APPLICATION OF UAV IN ENVIRONMENTAL MONITORING

Cândido AKAA[1], Paranhos-Filho AC[1], Silva NM[2], Haupenthal MR[1]

1-Universidade Federal de Mato Grosso do Sul, Faculty of Engineering, Architecture and Urbanism and Geography – FAENG; 2-Universidade Federal de Mato Grosso, Institute of Agricultural Sciences and Technology - ICAT. Emails: anny.keli@hotmail.com; Antonio.paranhos@pq.cnpq.br; normandes@ufmt.br; haupen@gmail.com.

Unmanned aerial vehicles (UAVs) are being increasingly adopted in civilian use, generating solutions in the environmental sector, in agribusiness, including public health and safety, among some applications. Because of their versatility, considering the continuous use in the same place, to obtain videos or images of high spatial resolution, the UAVs are a promising alternative, since they can present a more balanced cost-benefit relation, when compared to the other forms of data acquisition (Ex. aerial photographs obtained by manned aircraft). Some experiments will be presented that the Federal Universities of Mato Grosso and Mato Grosso do Sul (UFMT and UFMS) have been developing with the use of UAV in terms of environmental monitoring. The first case study presents a mapping of land use and occupation, in a nascent sector in the Municipality of Campo Verde - MT, in this it was possible to show in detail the different features present in the study area. The second shows an analysis, at the request of the Public Ministry of Mato Grosso, of the vegetation suppression in areas of permanent preservation, comparing data of loss of native vegetation, when the Forest Code was changed. The third work deals with water quality and chlorophyll a quantification through vegetation indexes generated from suborbital images, subsidizing the management of water resources in a transition region between the Cerrado and Pantanal. The fourth case study deals with a proposal to classify Pantanal bays and salt marshes, using vegetation indexes extracted from UAV images, with a view to refining the system of characterization of landscape units in the Pantanal plain.

Key words: DRONE; WATER BODY; REMOTELY PILOTED AIRCRAFT SYSTEMS (RPAS); AERIAL PHOTOGRAPHY.

Images

Group Photos