MODULE 6: Wildlife Conservation

Practicum 1: ANIMAL BEHAVIOR OBSERVATION

Summary

By researching the behavior of animals, zoo staff gain valuable information which contributes to keeping animals healthy and furthers conservation of wild populations of their species. Behavior is essentially anything that animals do in response to their environment. Animals engage in behaviors for four basic purposes: to find their basic needs, to avoid predation, to reproduce and interact socially, and to maintain health and resist diseases. In this activity, students will hone their observation and data collection skills by filling out this Animal Behavior worksheet.

Researcher's Name(s): ____________________________________ Date: ______________

Location: ______________________ Start Time: __________ End Time: ___________

Species Name: ____________________________

Number of Animals: ________________________

Description of Animal:

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Description of Habitat:

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Description of Animal Behavior:

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Use the list of behaviors below to record your observations.

Type of Behavior	Behavior	Code	Description of Behavior
Solitary	Sleep	S	Animal assumes species-specific position for sleep, stays in one place and is not alert to environmental changes.
	Rest	R	Animal stays in one place but may be roused easily by environmental changes.
	Groom self	GS	Animal engages in washing or smoothing its own fur or hair using tongue or forelimbs.
	Maintenance	M	Animal urinates or defecates.
	Travel	T	Animal moves from place to place.
Food Related	Eat	E	Animal consumes food it finds in its environment.
	Drink	D	Animal consumes water or other liquids found in its environment.
	Look for food	LF	Animal searches the environment for food items.
Social	Groom others	GO	Animal engages in washing or smoothing the fur or hair of another animal in its environment.
	Play	P	Animal engages in interactions with another animal that may involve locomotion, climbing, manipulating objects or other activities that show a relationship between two or more interacting animals.
	Contact	C	Animal comes in contact with another animal while engaging in a solitary behavior.
Aggressive	Fight	F	Animal engages in physical conflict with another animal in its environment.
	Steal food	SF	Animal approaches another animal that has located food in the environment and either by physical force or distraction, removes that food item from the vicinity of the other animal.

Practicum 2: Habitat Assessment

Summary

Students work in small groups and use wildlife habitat requirements to assess potential animal habitat based on map interpretation, plant and forest inventory information, on-site forest composition and structure, and wildlife habitat needs.

Upon completion of this lesson, students will be able to:

• Identify specific components of the forest that provide wildlife habitat.

• Assess the value of an area of the forest as habitat for a wildlife species

Procedure

HABITAT COMPONENTS

1. In small groups, students should brainstorm a list of wildlife species that might be found at on the FTI campus. Write all of the species on the board. At this point, do not remove any species that wouldn't likely be found at the forest.
2. Each group will select a wildlife species of interest from the list.
3. Each group will generate a generalized set of habitat requirements. The information generated will be used to develop a survey protocol to determine habitat suitability for a variety of species.
4. Groups will develop a generalized list of habitat components (e.g., a species requires trees >10” diameter).
5. Groups should create a master list of generalized habitat components, including…
    - canopy structure (layers)
    - canopy closure
    - size of trees
    - species of trees
    - shrub layer density
    - composition of shrubs
    - ground/herbaceous layer density
    - species of herbaceous plants (optional)
    - existence of snags
    - size of snags
    - degree of soil cover
    - existence of woody debris on forest floor

Practicum 3: Biomonitoring – Camera Trapping Basics

Introduction

Overview of Methods for recording wildlife

Direct observations are biased by some animals deliberately avoiding the observing humans, or others coming closer to investigate human presence. Active count methods such as **line transect** and **point counts** of direct (sightings) and indirect signs (footprints, claw marks, signs of feeding, faeces, and others) provide data only while the researcher is in the field. **Trapping** is often used for small rodents and mammals, the target is briefly trapped for observation, and marked before release for **capture-mark-recapture** studies. Besides requiring a lot of energy to trap some animals, the method can result in harm to the animal, such as birds which are injured during mist-netting. **Tagging** can be merged with trapping surveys, and GPS fitted devices such as collars then show movement and activity of tagged individuals.

Briefly review the listed methods for recording wildlife stated in the camera above. Have you already learned about these methods? Can you state any other cons of the methods described?

Camera traps – origins and benefits

In the last decades, **camera trapping** has become popular in scientific research on animals. The basic idea is animals trigger cameras remotely, without the need of a person to take a picture. This research strategy started with the development of cameras. It has evolved since, and nowadays these cameras and all the trigger equipment are ccontained in a little box, a camera trap.

Camera trapping has gained popularity because it is a *non-invasive method*, meaning that it does not invade on the animals' routines. Camera trapping is also popular because it *requires less effort* and yields a relatively large volume of data. It has the benefit of providing an extended survey as long as the battery and storage allow (1-5 months). Camera traps are stationery devices, however, and are completely dependent on the whim of passing species to collect records. This means that the selection of the location for placement of the camera plays a large role in the volume and significance of records. After that, camera traps can work remotely after initial set up.

Camera traps – Parts

A basic camera trap consists of:

- Digital camera with a lens
- Flash (white vs. IR (infrared)
- Movement sensor and/or heat detection sensor
- Test light
- Batteries
- SD-card slot

Some camera traps have a SIM-card holder so photos can be sent straight to a computer if there is mobile coverage in the area.

Camera traps – Settings

- ***Photo/Video/Hybrid*** – Nowadays, camera traps can not only take pictures, but also videos. Some models are even able to do a combination of pictures and videos, which is indicated with the term 'hybrid'.
- **Quality/Length** – As with all technology, the resolution of the pictures or the videos is important. These two parameters are important to consider if you have limited storage space on your SD-card. For example, a video of 60s will be a larger file than a video of 10s.
- **Flash: White/IR (Infrared)/Dark IR** – To decrease the disturbance to animals, researchers came up with Infrared (IR) flashes. The disadvantage is they give a black and white picture as outcome. Within the range of IR flashes, there are differences in 'visibility'. A normal IR flash is still visible for the human eye from about 10m. They developed a dark IR flash. This flash is generally not visible by the human eye, although it is visible if you put your eye very close to the flash.
- **Date/Time** – Setting up the date and time correctly at the start of the survey is crucial. This gives the opportunity to check on temporal variation patterns.

Camera traps – What to solve

You can find out what animal species are living in a specific area: **presence/absence** study. There are methods to estimate **densities**, although it's still a field in progress. For example, the number of pictures of a certain species per 24 hours could be a good parameter for relative abundance. As time and date are provided with the picture or video, it's possible to see when different species are active. Do they roam around all night, or do they use specific times at night? Maybe to avoid other species. Videos, on the other hand, given the option to study more in debt **behavioural questions**. The sounds recorded from videos also provide data.

Camera traps – Guide for field placement

Turn camera away from the East or the West to avoid useless pictures filled with the glare from the sun at sunrise or sunset.

Place camera trap perpendicular to the path animals are expected to use (trail along the ground or branch in a tree or other).

Place camera at a height to capture most animal sizes travelling along target surface (ground, treetop, branch, etc…). Large animals may only be captured partially, but enough for identification.

Place camera in an area which has been carefully cleared to avoid false triggers by vegetation, or blockage of passing individuals.

Take a test image with camera which is time stamped to ensure your starting point.

<u>Objective</u>

This practicum will introduce students to the basic functions and uses of a camera trap device.

<u>Activity</u>

Use the camera traps in FTI's inventory. Set up a short camera trapping survey in the Arboretum or Palm Farm. The results from this survey can be reviewed together after a week.

Consider safety and security of the cameras when placing them in selected locations.

Practicum 4: Working with Wildlife Data

Data Source: Biomon data_FFI_Sapo

Introduction

Perhaps the greatest barrier between monitoring and management is data analysis. Data languish in drawers and spreadsheets because those who collect or maintain monitoring data lack training in how to effectively summarize and analyze their findings. Statistical analyses constitute a fundamental step in making monitoring information useful to management. Unless a monitoring team has conducted a complete census of each habitat attribute, statistical analyses are needed to make inferences from the sampled data to the entire area of interest.

Over the last century, wildlife research studies have typically used **hypothesis testing** as the framework for conducting research and reaching defensible conclusions. The basic concept of hypothesis testing is to compare a research hypothesis with a null hypothesis by performing a **statistical test** and generating a significance level (p-value; i.e., probability of observing the data if the null hypothesis is true). The standard **null hypothesis** that one tries to disprove is that no effect or change occurred over time and that any observed patterns can be explained through random processes. Because one seldom explores phenomena that are unlikely to have an effect, nearly any study can result in statistical significance if the sample size is extremely large. In general, the failure to detect significant results has more to do with small sample size, which results in a low power to detect change. **Statistical significance** can serve as a baseline quality standard that allows research results to pass a test of research objectivity.

A key aspect of data analysis is to evaluate whether the results of a study are **biologically significant** and can be used to inform management actions. If the results are statistically significant, the monitoring team needs to ask whether the magnitude of change indicates a meaningful change in either habitat quantity or quality. For example, if the results of a monitoring study indicate a statistically significant increase in canopy cover from 33 to 35 percent, it is important to evaluate whether that difference has changed the quality of habitat for the emphasis species. If the emphasis species can successfully use a vegetation type when canopy cover is 20 percent or greater, the observed increase from 33 to 35 percent does not have biological significance. Conversely, if the results are insignificant, the monitoring team needs to evaluate whether the sampling design was sufficient to detect a level of change that is biologically meaningful.

Lab Exercise

Working with the dataset Biomon data_FFI_Sapo conduct the following simple statistical analyses.

1. Frequency count for species observed.
2. Create a graph that illustrates the correlation between frequency count for species observed and habitat type.