TD 3: Wildlife Sampling

I. Generalities

The study of fauna is based on:

a) a protocol including a sampling plan to organize data collection on a scientific basis and with a concern for representativeness;

b) A survey of natural heritage: since no single method can provide all the desired data, a combination of complementary methods will be used to provide as comprehensive a knowledge as possible of the study area.

-It is possible to classify these methods into two main categories:

- **qualitative methods**

These methods allow for the establishment of lists of species recorded at a site and its various sectors, generally among a few target groups: birds, butterflies, dragonflies, etc. On the other hand, they do not provide information on the abundance of populations;

- **quantitative methods**

These methods rely on direct counts (population size) or estimates. They provide both lists of species and numerical data on the abundance of these species, expressed in indices or densities.

These inventory methods can be applied to a site, a set of sites, and temporal monitoring.
These methods are practiced according to protocols specifying the type of data to be collected.
(contacts, captures, traces, ...) as well as the periods of passage, the equipment used, etc.;

c) an analysis of data that may include statistical treatments, and sometimes supplemented by indices reflecting the biological richness, interest, or quality of the studied ecosystem.

d) an interpretation of the results.

Remarks

To be as objective as possible, the evaluation must be based on comparisons with clearly described reference systems and according to well-defined criteria.

Understanding the ecological functioning of an ecosystem requires knowledge of a very large number of parameters. A forest cannot be reduced to the list of trees that are found in it. It is the result of a combination of factors such as climate, geology, soil, altitude, the presence of water, and even the historical use of the area by humans.

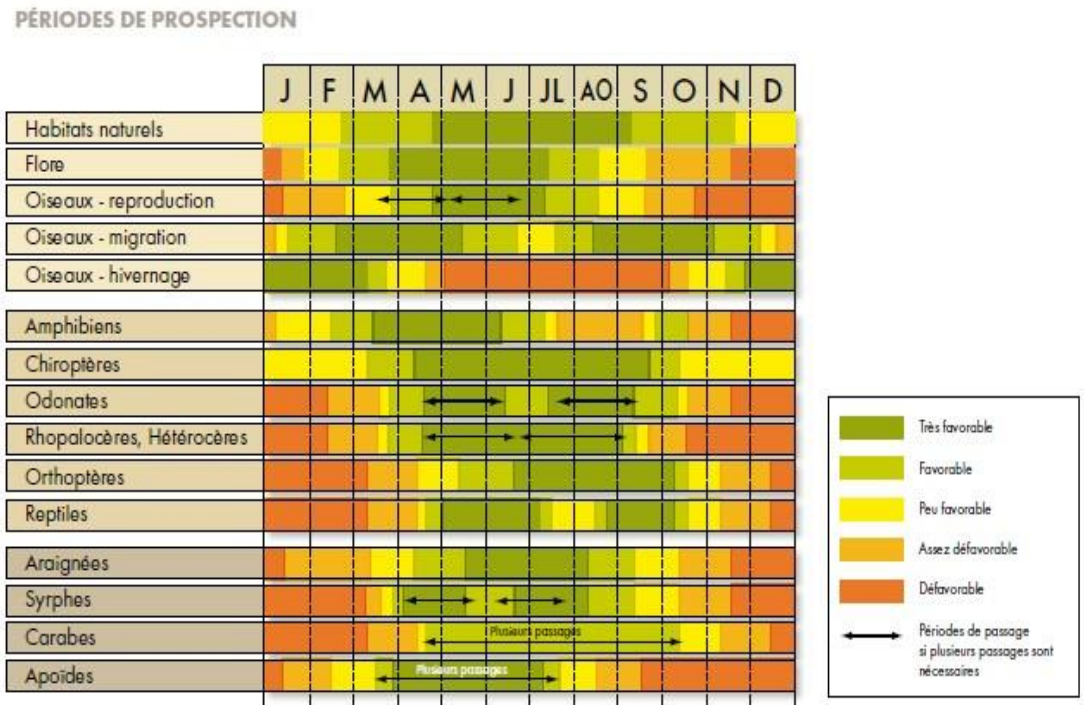
Each of these parameters can affect the species that live in this forest. To thoroughly understand an ecosystem, it would therefore be necessary to catalog the thousands of species present and analyze in detail its physicochemical components (soil acidity, nitrogen cycle, etc.).

Apart from a few groups that are relatively easy to spot and identify, such as birds, which can be recognized by their song or plumage, many animal species need to be captured to be identified, particularly among insects and other invertebrates.

Moreover, the discreet, nocturnal, aquatic, and burrowing habits of many animals sometimes make the use of traps or capture devices necessary. The choice of prospecting periods is crucial to obtaining the desired information. The table below provides general indications on favorable periods which may vary according to regions, altitude, or even weather conditions.

The periods of prospecting are a determining factor in ecological studies. The development of protocols and the interpretation of the results

obtained must always take the seasons into account. Spring is generally more favorable, particularly for flora, nesting birds, insects, and amphibians. The summer months remain favorable for some flora, certain insects, and even bats, while autumn and winter are lean periods, with some notable exceptions, particularly migratory birds and hibernating bats.



These periods are given as a guideline, but remain very variable, depending on altitude, latitude, annual variations, and the phenology of each species.

Precautions

From the simplest butterfly net to the heavy system of trap pots, the handling of living organisms is never without consequences!

Many species are fragile, and even the slightest injury, even a minor one, can endanger the captured animals. Moreover, some non-selective trapping systems indiscriminately capture animals and are likely to have a significant impact on biocenoses.

The studies must therefore be entrusted to competent individuals who are knowledgeable in:

- the legislative protection measures and fragile and/or protected species;
- protected areas and the constraints associated with them;

- the capture devices, their limitations, the risks associated with their implementation, the handling of animals.

Principles

The ecological approach is primarily based on field inventories, carried out according to precise and recognized methods, and standardized whenever possible. The process of such a diagnosis is best structured according to the following steps:

***Definition of the objective:** which also involves defining the question posed and the elements of knowledge to be provided;

- **choice of a data collection method:** One must choose a field technique that is suitable both for the study's objective and the available resources.

- **choice of a sampling plan:** which defines the type and number of sampling units as well as their distribution in space and time;

- **inventory of available resources:** in terms of time, human and material means, funding…;

- **adjustment**: based on the resources identified, of methods and sampling plans chosen, or even set objectives;

- **data entry, formatting** (tables, graphs, maps…), data analysis, statistical tests… ;

- **interpretation of the results** based on comparisons, investigation of causes, and response to the initially defined objective.

II. Mammals:

The class of mammals is composed of large mammals (giraffe, lion, hare...) and micro-mammals (rat, shrew, field mouse, voles, mouse, etc.).

II.1. Large mammals:

Active and passive methods were employed to detect the presence of large mammals.

***The active method:** used direct observation of species, and consists of

identify traces and sounds, study nests, feces, and others

indirect information to determine the presence of non-flying large mammal species at a given site. Indeed, direct observations and

the identification of traces and noises, following daily routes, are

carried out at night using a projector.

*** The method of passive observation:** they employed camera traps at each study site. The camera traps are generally activated by

heat detectors. Each camera trap uses a device in autofocus mode, equipped with a film. For example, the cameras are programmed to operate continuously and to wait 20 seconds between each photo.

They are placed in locations likely to be frequented by various species of mammals, such as refuge sites, trails, water points used by animals for wallowing, and feeding sites like those with fruit trees. The devices are also placed about 500 meters apart from each other.

In the case of elusive mammals, the method of camera traps may be more effective than the active method (transects), especially when observers have different levels of expertise.

II.2. Micro-mammals:

The inventory of small mammals is conducted using non-lethal trapping. The traps are

represented by rat traps for rats and traps called INRA for other micro-

mammals such as shrews, voles, field mice, etc.) (Fig. 1).

The bait used is a mixture of peanut butter, oats, and contained oil.

in the sardine cans. The 2 types of traps are checked after each night (in the morning) and

The captured animals are measured, identified, and then released or kept for identification.

later. To optimize the chances of capture and to have indications on the location

populations, the device is installed in a transect (theoretically along a line with a

trap every 30 meters) while covering the different environments to be sampled. The stations of

traps are temporarily marked indeed with colored ribbons and coordinates

are recorded using a GPS receiver.

Fig. 1. Rat trap (on the left) and INRA trap (on the right)

Bats are captured with standard nets (Fig. 2) ranging from six to twelve meters.

placed favorably, across streams, in presumed passageways in the forest

and on the edge of the forest, etc. The nets, deployed from 6:00 PM to 11:00 PM-12:00 AM, are checked every

30 to 45 minutes. The animals are removed from the nets, identified if possible, and released. The

individuals whose identification remains uncertain, are kept alive during the night in

cotton canvas bags and prepared for exams.

Fig. 2. Net for capturing bats