

Specialized Techniques; audio instruments, visual instruments, radiometry

Wildlife Radio Telemetry

INTRODUCTION

Radio-tracking brought two new advantages to wildlife research

- the ability to identify individual animals and
- the ability to locate each animal when desired.

Radio-tracking has been used to study animals as varied as large & small mammals, birds, snakes, crayfish, dolphins, Opera, and elephants. In addition to more straight forward applications such as movement to home range analysis and

mortality studies, radio-telemetry has proved useful in examining many diverse topics including

Disease transmission

Scent marking.

- Predation and co-evolution.
- Vocalizations.
- Socio-ecology and Breeding behaviors.

Sleep characteristics

- Physiological studies of heart rate, respiration rate, body temperature.
- Nest egg condition.

Telemetry

TYPES OF SYSTEMS,

The two types of radio telemetry systems include:

- Conventional VHF tracking systems

The GPS technology very High Frequency

There are additional systems available for telemetry studies (e.g., LORAN, hyperbolic methods, etc.), but these systems are used much less frequently.

VHF radio-tracking is the standard technique in use since 1963. An animal wearing a

VHF transmitter can be tracked by a person on the ground or in the air with a spatial receiver and directional antenna.

The advantages of VHF tracking are relatively low cost, reasonable accuracy for most purposes, and long life. The disadvantages are that it is labor-intensive and can be weather-dependent if aircraft-based.

Nevertheless, VHF radio-tracking is by far the most useful and versatile type of radio-tracking, for not only does it yield location data, but it also allows investigators to gather a variety of other types of information.

Transmitting system

Basic transmitting systems include

- A transmitter unit
- Power supply/source

- Transmitting antenna
- Material to protect the electronic components and
- Material to attach the transmitter to the animal.

The size and mass of the total transmitting package, type and strength of signal and life of the unit vary considerably

Transmitting Antennas

Transmitting antennas are critical components of radio-transmitter packages since

they project the signal for capture by receiving antennas. Along with power

the antenna's orientation,

construction, and length determine the effect.

Radiated (ERP), and therefore, the range at which the signal can be received ideally, antennas should be oriented

perpendicular and away from the animal. However, such antennas become entangled in vegetation, break off or are. Thus often they are embedded between layers of a collar, thus protecting the compromising their range.

"Types of Transmitting Antennas

Two basic types of transmitting antennas are; whip antennas and loop antenna.

Whip Antennas

Whip antennas consist of a wire with one free end and the other end attaches to the transmitter. Usually stainless steel with a Teflon coating. Ideally, it must be strong, and generally withstand a tremendous amount of flexing. The antenna paint must be thoroughly sealed to prevent moisture damage to the transmitter.

Pros/Cons:

Produce more uniform signal over a greater distance than the loop antenna"

Potentially subject to breakage through metal fatigue or corrosion however, whip antennas may be sandwiched between layers of a collar for protection when attached to

rough species (eg, bears).

V Loop Antennas

Cooper antennas (connected on both ends to the transmitter) are usually used on small mammals. Loop antennas consist of copper, brass, or coated wire which fits around the animal's neck. The diameter of the loop is adjusted to tune the antenna to match the frequency of the transmitter.

Therefore, if the loop collars are tuned prior to use on an animal, the diameter must not be altered. Otherwise, the loop collars can be tuned. In the field when placed on an animal.

Pros/Cons

Signal does not travel as far as whip antenna. Useful for species which would chew/pull whip antenna. Wire loop may serve as both collar and antenna.