

Methodology for Terrestrial Fauna Studies

1. Introduction

Vertebrate animals can generally be divided into four groups. These are:

- FROGS (Amphibia)
- REPTILES (Reptilia)
- BIRDS (Aves) (birds will be study by ornithologist)
- MAMMALS (Mammalia)

Vertebrates are creatures that live in social groups, learn to organize their lives in line with their ecological acquisitions, and use the knowledge they have learned. This issue should be taken into account in activities to be carried out in areas where vertebrate animals live. In other words, if the bat colony perceives light other than natural light in the cave where they live, and this light poses a vital threat within the ecological acquisition of bats, this colony leaves that cave. Or if a rodent colony detects a threat in its nesting area, it produces a solution. Large Carnivores and Artiodacties reduce the number of offspring, stop pregnancy or do not reproduce despite nutrient shortages or other threats.

Vertebrates survive in ecosystems to the extent that they can form their niches. Niche is the activity of a living thing in the flow of energy. These activities of vertebrates determine biological needs. Biological needs can be defined as nutrition, (shelter) living space, reproduction and socialization, and it is interlaced. Unless the previous need is met in the ecosystem, it is not possible to meet the next need. While Vertebrates meet their niches in the whole ecosystem, they can meet their biological needs in different habitats. In other words, while a vertebrate species feeds on a habitat, it can meet its shelter in a different habitat. While bats mostly use caves to perch (shelter), they fly in wet and swampy habitats where flies and insects are abundant to feed.

For these reasons, in vertebrate field studies, data are collected by direct observation (collecting data of the sample or sample), scanning the literature, indirect observation (observation of habitat suitability).

In the evaluation phase, forecasts are presented by making a two-step evaluation.

1. Interaction with vertebrate animals during the activity,
2. Post-activity interaction with vertebrates was evaluated.

2. Data Collection

a. Literature and evaluation of study records

By literature review to search about vertebrate species living in the determined study area until the time of the study, the data about the vertebrate species in the area are collected and predictions are made for the next stages of the study. Research area for vertebrate animals is the proposed activity area and ecological impact limits of the area are evaluated seasonally in terms of nutrition, habitat, reproduction and social behavior.

b. Habitat assessment

With the commencement of the study, the specialists visit the study site and their habitats are evaluated seasonally and the possible vertebrate species in the area are firstly determined, and these determinations are recorded. A list of the vertebrates in the field is created by comparing the data obtained from the field with the literature records.

c. Information gathering by interviewing people (especially hunters and farmers) living in the Project area and impact area

During the field visits, information about the types of the area and the populations of these species are collected through questionnaires or one-on-one interviews with local people, especially hunters and farmers. By visiting hunter associations, chambers of agriculture and nature conservation associations, information about the vertebrates and their populations are collected. During the interviews, data such as vertebrate hide, skull, teeth and horn found in houses, workplaces, associations, restaurants and leather shops are recorded and evaluated.

d. Interim evaluation

By evaluating the information obtained as a result of the literature review, habitat assessment and interviews with the inhabitants of the region, a general assessment is going to be made on the vertebrate species and populations in the area. As a result of this interim evaluation, important areas, species and populations are determined. As a result of these assessments, the study plan can be revised to determine how the specific area, species and populations will be affected and how this effect will be minimized. More data are obtained through traces, feces, hair, feathers, nests, sound recording, observation (viewing) and sampling in the specified priority species, population and areas.

e. Trace, feces, hair, hair, nest and voice recording

Since the habitat preference of each group in the area will be different, the data for each group are collected using different methods. Traces, feces, hair, feathers, nests and sounds are distinctive features for vertebrate animals, and the data collected are obtained as a result of laboratory evaluations about vertebrate species and populations living in the area.

- The image recording of FROGS (Amphibia) is made during daytime.
- REPTILES (Reptilia) image, skin registration is done during daytime.
- The image and sound recording of BIRDS (Aves) is done during daytime.
- MEMELİLER (Mammalia) image traces, feces, hair, feathers, nests and sound recording is done during day and night times.

f. Observation (imaging)

First of all, vertebrate species living in the area will be tried to be imaged using cameras and video cameras as much as possible. Also, data is obtained by observing birds, carnivores and ungulates from a distance with binoculars. During field observations, the traces, feces, hair, feathers, nests and images of individuals / individuals detected from vertebrates are documented with a camera or video camera. During the observations, the coordinates of the place where the presence of a species is determined are recorded with the JPS.

g. Recording the location of the observed sample in the field

With Artiodactyla (Hoofed) observations, observation points are determined in the study area and in the ecological impact area, samples can be seen with binoculars and their populations are determined. Image will be taken if possible. Local houses are visited by hunting associations and if there is any identifiable material belonging to ungulates, diagnosis is made. In addition, interviews are made with the National Parks Hunting and Wildlife Provincial Directorate and if there is an inventory or a record, it is provided for evaluation.

h. Analysis / evaluation

Analysis of the study area in terms of vertebrate biological needs; (evaluations need to be made seasonally)

- 1) Nutrition
- 2) Habitat
- 3) Reproductive

4) Socializing

1. Do vertebrate animals use the work area regularly or irregularly for feeding?

Evaluation of the study area with potential food sources after determining the vertebrate fauna.

2. Do vertebrate animals use the study area regularly or irregularly for nesting purposes?

Daily or seasonal usage control.

3. Do vertebrate animals use the work area regularly or irregularly for breeding purposes?

Daily or seasonal use control.

Is there a breeding nest, do the puppies have daily circulation?

4. Do vertebrate animals use the work area regularly or irregularly for social activities?

Play, offspring development, migration, fight, mating,

After the data mentioned in the eight items above are determined, the interaction status of the vertebrate species found to live in the area during and after the activity will be identified.

i. Identifying the susceptible or vulnerable species

Species identified in the study area will be categorized according to their exposure status; sensitive and protected species are determined, if any. It will be evaluated in terms of international agreements concerning vertebrate species (BERN, IUCN etc.) to which Turkey is a party.

j. Determining the ecotone region in the immediate vicinity of the Project area

Conserving alternative habitats for vertebrate species using the area and creating stock populations for post-restoration will be assessed.

k. Measures to be taken

Priorities for minimizing the impact of the proposed activities of the Project on Vertebrate biodiversity.

1. Minimization of usage area

2. Creation and protection of ecotone zones in the periphery of the project implementation area.
3. It is the formation of faunistic succession with ecological restoration.
 - a. Before the construction works: Before the work starts, the field vertebrate expert gives a training to the auditor, manager, technical staff and workers in order to inform them about the field vertebrates in line with their respective responsibilities and activities.
 - b. After the construction works: After the completion of the construction in the field, the predictions about the changes that may occur in the species, population and behavior of the vertebrate animals are determined and the precautions to be taken in possible situations are determined.
 - c. Alternative habitats in ecotone regions are determined in the close vicinity of the activity area and these habitats are protected for stock populations.
 - d. Continuity of stock populations in alternative habitats is controlled with annual monitoring.
 - e. After the construction and during the operation phase, ecological restoration is carried out and it is determined with the followings whether the succession of the vertebrate has occurred. Additional measures are determined if necessary.

I. To ensure sustainability.

1. Recognition
2. Avoidance/protection
3. Transport
4. Improvement

m. Training to gain a culture of living in harmony with nature (first, managers and white-collar workers, then workers)

1. Why right now
2. Who is the guest who is the host?
2. Nature conservation biodiversity (protecting genes)

3. Adding value to the future
4. Have a story to tell to your grandchildren, who are your genetic investment

n. Monitoring

1. Monitoring apps
2. Monitoring of ecotone regions
3. Monitoring of populations
4. Monitoring of target species
5. Monitoring of ecological restoration infrastructure
6. monitoring of ecological restoration
7. Monitoring of ecosystem services

All these studies are proposed on based on IFC (International Finance Corporation), IFC Performance Standard 6: Conservation of Biodiversity and Sustainable Management of Living Natural Resources (=Environmental and Social Policy; Performance Requirement (PR) 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources.) criteria.

1. According to Performance Standard 6, protecting and sustaining biological diversity, maintaining ecosystem services and managing natural resources sustainably are the foundations of sustainable development. The conditions stipulated in this Performance Standard have been prepared in accordance with the Convention on Biological Diversity. In the Convention on Biological Diversity, biodiversity is defined as “the differentiation between living organisms from all sources, including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which these ecosystems are a part; including the diversity within and between species and the diversity of ecosystems”.

2. Ecosystem services refer to the benefits that people and companies/businesses derive from ecosystems. Ecosystem services fall into four groups: (i) supply services, which include products that people derive from ecosystems, (ii) regulatory services, which include the benefits that people derive from the regulation of

ecosystem processes, (iii) cultural services, which include the intangible benefits that people derive from ecosystems, and (iv) supporting services that include natural processes that maintain other services.

3. Biodiversity often supports ecosystem services that are valued for humans. Thus, impacts on biodiversity can adversely affect ecosystem services. This Performance Standard addresses clients' ability to sustainably manage and mitigate their impacts on biodiversity and ecosystem services throughout the project lifecycle.

The objectives of IFC Performance Standard 6 are;

- * To protect and sustain biodiversity.
- * Sustaining benefits from ecosystem services.
- * Promote the sustainable management of living natural resources by adopting practices that cover biodiversity conservation needs and development priorities.

Important Note:

1-Aquatic survey are being done since from October 2021.

Invertebrate study is planned for Spring 2022 during vegetation season when the invertebrate activity will be intensive. Because it is not possible to observe the invertebrates, especially at high altitudes, at the end of autumn, i.e., October.

2- Possible critical habitats and target species used to identify these habitats are being determined in this Fall season survey in 2021.

3- Amanos Mountains KBA and species from the desktop studies are determined and integrated into field plans.

4- Ornithological studies are being done in the mean time together with the terrestrial fauna survey.