Field Work Summary

Health and Safety

1. **Hazards** in field work could be: adverse weather conditions, difficult terrain, contact with harmful microorganisms and problems associated with isolation

2. **Risk** = likelihood of harm arising from exposure to a hazard

3. **Risk assessment** = identify control measures to minimise a risk

4. **Control measures**: appropriate clothing/footwear/equipment & means of communication

Sampling of wild organisms

1. Sampling should minimise impact on wild species and habitats

2. Consider rare and vulnerable species as well as habitats protected by legislation

3. **Point count** = observer records individuals seen from a fixed point count location (can be compared to other locations or with data from same point at a different time)

4. **Quadrats** of suitable size & shape/**Transects** used for sessile or slow moving organisms

5. **Capture techniques** (eg: nets/traps) are used for mobile species

6. **Elusive species** can be sampled directly using **camera trap** or **scat sampling**

Identification and Taxonomy

1. Organisms identified using classification guides, DNA/protein analysis or biological keys

2. Organisms can be classified by taxonomy and phylogenetics

3. **Taxonomy** = identifies/names organisms & classifies them into groups based on shared characteristics. Classic taxonomy is based on morphology— Biology that deals with living organisms and relationships between their structures.

4. **Phylogenetics** = study of evolutionary history and relationships between individuals/groups of organisms. This can change the traditional classification of many organisms.

5. Genetic evidence can reveal relatedness obscured by **divergent evolution** (Organisms DO share a common ancestor & diverge into different species) and **convergent evolution** (when Organisms evolve to have similar traits but DON'T share a common ancestor.

6. Knowing taxonomic groups allows predictions/inferences to be made about an organism based on a model organism.

7. **Chordates** (sea squirts and vertebrates) **Nematodes** (round worms) and **Arthropods** (joint-legged invertebrates with segmented body typically with paired appendages) are examples of taxonomic groups.

8. **Model organisms** = organisms that are easily studied or have been well studied. This known information can be applied to species that are difficult to study directly.

9. Model organism examples: *E.coli* (bacteria) *Arabidopsis thaliana* (flowering plant), *C.elegans* (nematode) fruit fly (arthropod) mice, rats and zebrafish (all chordates)

Monitoring populations

1. **Indicator species** = species that can give information of environmental qualities (eg: presence of a pollutant) by their presence, absence or abundance.

2. Susceptible and favoured species can be used to monitor an ecosystem

- Absence/reduced numbers indicate that a species is susceptible to an environmental factor.

- Abundance/increased numbers indicate that it is favoured by the conditions

3. Mark and recapture technique is used to estimate population size:

N = Estimated population size   **M** = sample is captured, marked & released

C = Second sample is taken   **R** = number that are recaptured

$$N = \frac{(MC)}{R}$$

4. This method assumes that all individuals have an equal chance of recapture, there is no immigration or emigration and that **individuals that are marked and released can mix fully and randomly with the total population**.

5. Methods of marking: banding, tagging, surgical implantation, painting, hair clipping. All methods must minimise impact on the study species

Measuring and recording animal behaviour

1. **Latency** = time between stimulus occurring and the response

2. **Frequency** = number of times a behaviour occurs within the observation period

3. **Duration** = length of time each behaviour occurs during the observation period

4. An **ethogram** is a list of species-specific behaviours observed and recorded

5. Recording the duration of each behaviour on an ethogram, together with the total time of observation, allows a **time budget** to be made.

6. **Anthropomorphism** is when human emotions are applied to animals or objects—this should be avoided as it can lead to invalid conclusions