













DERIVATION OF INDICATORS FOR ASSESSING THE QUALITY OF BIOTA SAMPLES AND THEIR SUITABILITY FOR ENVIRONMENTAL MONITORING STUDIES

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Introduction

- > The EU-funded LIFE Apex project aims to foster and improve the systematic use of chemical monitoring data from apex predators and prey (AP&P) samples for regulatory purposes
- ➤ In the context of chemicals management, monitoring data from appropriate biota samples can prove the presence of chemicals in the environment and support the prioritisation of substances for further hazard assessment
- > AP&P samples for such investigations are already available in **Environmental Specimen Banks (ESBs), Natural History Museums** (NHMs) and Research Collections (RCs)
- ➤ These organisations apply different sampling approaches (systematic and/or opportunistic) and sample storage conditions
- > For AP&P samples certain important specimen-related data have to be available and basic quality assurance aspects must be considered

Survey

- A survey was conducted among ESBs, NHMs and RCs on the application of guidance documents and guality assurance measures for sampling, processing and archiving of AP&P samples in 2019
- The survey evaluation revealed great differences regarding quality assurance measures between participating organisations
- However, basic information on archived specimens is mostly available (e.g., sampling location and date, biometric data)
- The temperature for archiving mostly is -20°C or -80°C; only one RC and two ESBs in the survey are using -150°C storage in the inert gas phase of evaporating liquid nitrogen
- > Some institutions collect samples specifically for contaminant monitoring purposes and sample treatment is conducted by experts trained in chemical monitoring, often following specific guidance documents
- Organisations archiving samples for other purposes than chemical monitoring have sometimes only limited possibilities to consider contamination aspects

Indicators for the quality and suitability of samples for environmental monitoring of chemicals Sampling

- > Unique sample code / designation
- > Species name (resident or migrant species?)
- Date of sampling / finding
- > Sampling approach: e.g., opportunistic or systematic sampling
- Location where sampled / found (geo-coordinates, if
- > Description of the state of the sample (for opportunistic samples, e.g., state of autolysis; if possible, estimated time of death under consideration of actual environmental conditions)
- > Biometric data: e.g., weight, size/length, sex, age (juvenile/adult); cause of death
- Information whether an individual was euthanised or received medical treatment (may be relevant if a sample was received, e.g., from a wildlife rehabilitation centre)

Derivation of indicators for the suitability of biota samples

- > Based on the survey answers and discussions in the LIFE Apex project team, indicators were derived to allow an assessment of the suitability of biota samples for environmental monitoring investigations
- The indicators are covering aspects from sampling, processing and
- These indicators will be used to assess the quality and appropriateness of the samples for environmental monitoring in the LIFE Apex project

Processing

- > Description of handling: e.g., examination, organs dissected
- Date of each processing step
- > Preparation of composite samples, if applicable, from several individuals: information on, e.g., number of individuals, selected tissue, amount of each individual used, age and sampling region of individuals
- > Homogenisation of tissues, if applicable: description of procedure

Archiving

Date of freezing

- > Storage temperature, e.g., -20°C (maximum -15°C), -80°C (maximum-70°C), -150°C (maximum-135°C)
- > Description whether the whole organism is stored or only individual organs
- > Amount of sample available
- > Material of sample packaging (e.g., glass bottles, aluminium foil)

Additional important information on AP&P samples to be provided

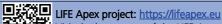
- Is the sample classified as a biological hazard?
- Which materials were in direct contact with the tissue sample / specimen during sampling or processing (field packaging material, working benches/plates, gloves etc.)?
- Are field-blank samples available (or samples from less anthropogenic influenced/near-natural sites, which can be analysed in comparison to samples that are expected to have higher burdens)?
- Are the fat and water contents of tissues available?
- Is the **trophic position** of specimens known (e.g., from stable isotopes)?
- Are already data from previous chemical analyses available?

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We thank all researchers/institutions who supported our survey and provided information on their programs. A detailed document on the survey evaluation is available on e-mail request.





Visit the homepage of the LIFE Apex project and download our newsletter or retrieve monitoring data from the LIFE Apex database. A specific data collection template is available (link)

