



LIFE APEX Guidance on sample selection, processing and labelling

What is LIFE APEX?

The AIM of LIFE APEX is to improve systematic use of chemical monitoring data from apex predators and prey for protecting human health and the environment. LIFE Apex involves making better and more cost-effective use of chemical monitoring data from the large, valuable but under-used resources from environmental samples in Europe's Environmental Specimen Banks, Natural History Museums and other research collections. The project will make use of state of the art analytics (e.g. non-target, wide-scope target and suspect screening) that allow for screening of several thousands of chemicals in each sample and prioritization of frequently occurring pollutants and their mixtures. For further information please visit <https://lifeapex.eu/>.

Which analytes will be investigated?

- Personal care products
- Steroids & hormones
- Pharmaceuticals (>450)
 - Antibiotics (>50)
- Illicit drugs and new psychoactive substances (>500)
- Industrial Chemicals (>100)
- Pesticides (>900)
- Sweeteners
- Surfactants
- Mercury
- Biocides
 - Quaternary ammonium compounds
- PAHs, PFAS, OCPs, PCBs, PBDEs
Polychlorinated naphthalenes, Fatty acid methyl esters
- Chlorinated alkanes
- novel organophosphorus flame retardants, Declorane Plus
- And many more...

What happens with the data?

All results of LIFE APEX will be stored in four databases and analytical results will be accessible for all replication and transfer partners (i.e. sample providers).

1. LIFE APEX sample catalogue
 - Lists samples of environmental specimen banks, research collections and natural history museums that are available for biomonitoring
2. LIFE APEX chemical occurrence data
 - Collects analytical results for biota samples from various monitoring programs



3. Suspect list exchange

- Uses substance lists of the NORMAN network. For example, ECHA has provided a list of 40,000 registered substances, which will be used in LIFE APEX

4. Digital Sample Freezing Platform

- Collects chromatograms of the LIFE APEX samples

What species are we looking for in LIFE APEX?

Predators

- Marine mammalian predators (e.g. harbour seal or taxa of the same trophic level, e.g. grey seal or dolphins)
- Limnic mammalian predators (e.g. Lutrinae, it is assumed that otters are present in sufficient quantities all over Europe)
- Terrestrial raptors (e.g. common buzzard or taxa of the same trophic level e.g. northern goshawk, Falconinae etc.)

Prey

- Freshwater fish (e.g. roach or taxa of the same trophic level)
- Marine fish (e.g. eelpout, herring or taxa of the same trophic level)

What sample do you we need?

Liver samples (predators)

- 28.8 g (minimum) or 52.2 g ww (optimum) as pool sample from at least 5 individuals. Individual samples were collected from the same region

Filet samples (prey)

- 141 g (minimum) or 261 g ww (optimum) as pool sample from at least 5 individuals. Individual samples were collected from the same region
- A pooled liver sample from 5 individuals represents one Life APEX sample
- Organisms have been collected in recent years (2015-2020)
- Samples were stored at -20°C or lower temperatures

Information on pooling:

- Same sample region as basic requirement (sample region is dependent on species distribution and not further defined within LIFE APEX)
- Same age class (preferentially adults)
- Same sex (in case of predators)
- Comparable size

All samples will be pooled and freeze-dried at the University of Athens. A registration number in accordance to Regulation (EC) No 1069/2009 for receiving animal by-products and derived products can be forwarded on request. Please clearly indicate which liver samples belong to one pool (e.g. by using the same vial for 5 liver samples).



What kind of data is requested?

- Species name
- Sampling approach (e.g. opportunistic or systematic sampling)
- Location (preferentially GPS data)
- Date of sampling/finding
- Weight of every liver sample within each pool
- Biometric data e.g.:
 - weight, size/length
 - age class (adult, juvenile, immature)
 - sex (in case of predators)

Required data on quality assurance:

- Date of freezing and temperature of storage
 - The sample should be maintained in a cold chain (at least -20°C) and ideally send in labeled glass vials
- Recording on confounding factors (euthanasiation, medical treatment, potential cause of death, if applicable)
- Description of the state of the sample (for opportunistic samples, e.g., state of autolysis and, if possible, estimated time of death)
 - The sample should originate from a freshly found organism
- Description of handling procedures (e.g. examination, organs dissected)

Thank you for your collaboration!

LIFE APEX Team



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Thank you for you collaboration!

LIFE APEX Team

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