

**ESTABLISHING THE BANK OF CETACEAN TISSUE SAMPLES IN UKRAINE
PROGRESS REPORT**

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The project “Establishing the bank of cetacean tissue samples in Ukraine” was conducted by the Schmalhausen Institute of Zoology of National Academy of Sciences of Ukraine in Kyiv, Ukraine, with the expert support of Ukrainian Scientific Center of Ecology of the Sea in Odesa, Ukraine. The project aimed to establishing the national tissue bank of cetacean samples, the first Ukrainian facility of this type for wild animals; and starting collection and archiving of cetacean tissue samples obtained from strandings, bycatch, biopsy, environment sampling and captivity. The project directly implemented the ACCOBAMS Conservation Plan for Black Sea cetaceans (Resolution 3.11), focused on the Activity 15c: (Establishing Black Sea cetacean tissue bank(s) accumulating samples from stranded and bycaught cetaceans), filling the gap in this provision, and the Resolution 3.9 (Guidelines for the establishment of a system of tissue banks). It was focused on (but not limited to) endangered and vulnerable Black Sea species (harbour porpoises, bottlenose and common dolphins). This project was focused on Ukraine with involvement of old collections and current fieldwork, and creating the background for joining other Black Sea countries in future. Project activities included purchase of the equipment, development of the action plan, promoting the new facility, collecting and archiving the samples and creating their catalogue.

The main result of the project was the successful launch of the newly established Ukrainian Tissue Sample Bank (UTSB), National Bank of Cetacean Samples, which showed its resilience. The main storage is the Arctiko ULUF 750-2M freezer facility of 750 l capacity supporting -80°C regime needed for long-term storing of RNA and DNA samples and the emergency power supply capable for 72 h of operations. Also the Bank includes a -20°C freezer and room temperature facilities. It is backed by a temporary storage (a -20°C freezer) in Odesa and a histological lab including age determination unit. The Action Plan was developed for the tissue bank, and its mission was identified as a regional collection, research and expert center, the core of a future center of excellence. Good practices for sample sharing were introduced. Promoting the new facility included networking with other tissue banks (primarily, the Mediterranean Marine Mammals tissue bank), communication during the 2nd World Marine Mammal Science Conference (2019), Life APEX meetings, 2022 Meeting of the ISBER (International Society for Biological and Environmental Repositories) and listing in the Global Stranding Network and ACCOBAMS regional lists of institutions and labs dedicated to population genetics. Cooperation with the Mediterranean Marine Mammals tissue bank and technical assistance from it was critically important for the response to the mass mortality and strandings of harbour porpoises and common dolphins in the Black Sea in 2022. Cooperative agreements on sample treatment were signed between Schmalhausen Institute of Zoology and Ukrainian Center of Ecology of the Sea, National Antarctic Research Center. Technical assistance and sample treatment involved Ukrainian cryobiological, embryological and veterinary institutions.

Ongoing and planned applications included research projects on pathology, toxicology, population genetics, evolution (including genomics and transcriptomics), embryology, life history and environmental studies (eDNA analyses). Also, the facility played a critical role for sample collection and transportation during the investigation of the causes of cetacean mortality by the environmental crimes department from the Odesa office of the Prosecutor General of Ukraine. Promoting the Bank activities and strengthening public awareness led to enhanced reporting of strandings and improved

response and cooperation from the staff and administrations of natural reserve areas, environmental inspectors, emergency services, police and local authorities, as well as rising citizen science effort. Collecting and archiving the samples included creating an inventory of old collections and samples, obtaining of samples from stranded animals provided by institutions and researchers having the relevant national permits, obtaining of environmental samples (e.g., eDNA from water and sea sediments); and initiating the system of exchange and backup between tissue banks. An extensive collection of old samples from polar, Black and Caspian Sea marine mammals (including rare taxa, in total 12 cetacean and 3 pinniped species), containing numerous embryos, organs (including brain), tissue samples, teeth and bones, was inventoried and its digitation was initialized. The new samples from stranded cetaceans were received from the Ukrainian Scientific Center of Ecology of the Sea; these included organs (including brain), tissue samples, flippers, teeth and bones of three Black Sea cetacean species. Among them, there were samples collected at dissections made during the mass mortality event in 2022. Also, environmental samples from Antarctica were received for temporary storage. Appropriate storage conditions include low (-80°C, -20°C, +8°C) and room temperature under climate control; frozen, RNA later, ethanol, cryoprotector media and other buffer solutions. The catalogue of samples was created.

Establishing the practice of samples exchange and backup including the Mediterranean Marine Mammals tissue bank is in progress, as a part of emergency response action for the cases of mass mortality and mass stranding events. Future developments will include developing routine, secure and rapid procedures of samples sharing and cooperative research between the authorized scientific institutions within the ACCOBAMS and ASCOBANS areas, following the best standards and providing sustainable environment for conservation research.