



Circular economy for biodiversity: Unlocking the green potential

*Skills for sustainable,
resilient, and socially
fair communities*

**EUROPEAN
YEAR OF
SKILLS**



Date

June

5



The State Scientific
Research Institute
**NATURE RESEARCH
CENTRE (NRC)**

Vilnius, LITHUANIA

3-11 June 2023

**#EUGreenWeek
PARTNER EVENT**

The State Scientific Research Institute NATURE RESEARCH CENTRE (NRC)



NRC is a public legal entity, the largest in the field of **geo- and bio-sciences** in Lithuania, performing long-term research and experimental (social and cultural) development activities in the field of the natural sciences.

MISSION of the NRC is to generate, generalize and spread new knowledge of natural sciences, develop **fundamental and applied research** aimed at substantiating ecosystem protection provisions and sustainable use of their resources for meeting the needs of society.

VISION of the NRC describes it as an internationally competitive research and study institution performing fundamental and applied research into **living and non-living nature ecosystems**, the knowledge of which ensures the quality and continuity of society's life in the context of diverse ecosystem dynamics and the resultant social challenges.

NATURE RESEARCH CENTRE (NRC)



Relevance to the topics:

- **research on biodiversity, habitats, conservation and restoration;**
- **impacts of climate change and human activities on ecosystems and their services;**
- **dispersion of hazardous substances, pathogens, and stressors in a changing environment: risk assessment and remediation.**

NATURE RESEARCH CENTRE (NRC)



Research team and Infrastructure:

- **177 scientists** (26 Chief Researchers, 80 Senior Researchers, 56 Researchers and 15 Junior Researchers), together with 107 engineers, biologists and employees of assistant departments (January 2023).
- **Twenty-two scientific laboratories installed.**
- **52 doctoral students** (January 2023).
- **18 pos-doc fellows** (2018-2022).
- **Foreign employees, doctor students and post-doc fellows from Australia, Ukraine, France, Brazil, Russia, Poland, Mexico, Romania, Bangladesh, South Africa, Belarus, Italy are working/studing at the NRC**



NRC – *our expertise*

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Project activity – fundamental and applied research

NRC – *our expertise*

HORIZON2020 (as **Novel Productivity Enhancement Concept for a Sustainable Utilization of a Geothermal Resource (SURE)** (Project ID: 654662) http://cordis.europa.eu/project/rcn/199554_en.html; **Avian malaria, anti-malaria and telomerase treatments experiment – CANARIES**)

LIFE (as **Algae – economy based ecological service of aquatic ecosystems**)

BILATERAL PROJECTS (as **Latvian-Lithuanian, Lithuanian-Ukraine, Lithuanian-Poland, Lithuanian-Swiss** scheme financed by SCL, etc.)

Projects financed by the RESEARCH COUNCIL OF LITHUANIA (as Projects of the National Programmes, Researcher Groups' projects and etc...)



- **DEVELOPMENT OF SPECTROMETRIC TECHNOLOGY AND PROTOTYPE METHODOLOGY FOR PREVENTIVE OYSTER QUALITY ASSESSMENT *IN SITU*** 01.2.2-MITA-K-70, measure "Promoting Commercialization and Transnationality of R&D Results,,
- **PUBLIC PROCUREMENT CONTRACT FOR ICHTHYOFAUNA AND AQUATIC FLORA (MACROPHYTES AND PHYTOBENTHOS) RESEARCH SERVICES** 05.3.1-APVA-V-011, measure "Management and protection of the water resources"
- **INNOVATIVE BEEHIVE PROTECTION AND MONITORING SYSTEM** Lithuanian Rural Development Programme, measure "Establishment of EIP action groups and development of their activities"
- **UPDATE (STATUS ASSESSMENT) ON THE MANAGEMENT OF THE ENHANCED PROTECTION OF THE LITHUANIAN BALTIC MARINE ENVIRONMENT** (Agreement for R&D activity)
- **HYDROGEOLOGICAL MODELLING AND ANALYSIS OF RECONSTRUCTION AND CONVERSION OF IGNALINA NPP BITUMINISED RADIOACTIVE WASTE STORAGE FACILITY INTO REPOSITORY** (Agreement for R&D activity)
- **RESEARCH ON THE STATUS OF INVASIVE AND ALIEN SPECIES IN LITHUANIA**
- 05.5.1-APVA-V-018-01-0012 „Environment, sustainable use of natural resources and adaptation to climate change”
- **SERVICES FOR THE INVENTORY OF PLANT SPECIES OF THE EUROPEAN UNION IMPORTANCE** (LIFE-IP PAF-NATURALIT Nr. LIFE16 IPE/LT/016)
- **3D BIOTEXTILE WITH TECHNOLOGICAL COMPOSITION OF NANO PARTICLES TO ENHANCE THE PROTECTING PROPERTIES** (M-ERA.NET)
- **CONSUMPTION OF FEED INTENDED FOR INSECTS, ITS IMPACT ON GROWTH, PRODUCTIVITY AND RESISTANCE TO DISEASES** (Agreement for R&D activity)

Nature Research Centre (NRC)

Collection of microorganisms (fungi, bacteria, oomycetes) from all types of environments (**water, plant, soil**):

- **invasive microorganisms**; mutualistic species (fungi, mycorrhiza);
- **endophytes**, rhizospheric, plant pathogenic microorganisms;
- **biological control agents** (microorganisms), the preservation and enhancement of natural enemies of plant pests (e.g., beneficial insects/mites/nematodes/antagonistic, symbiotic microorganisms, beneficial endophytes)

Expertise:

- development of methods for the **identification, early detection and surveillance** of invasive alien species;
- development of **sensors** for biophysical signals (VOC's);
- **high-throughput DNA-based techniques** (for example DNA-barcoding, gene flow etc.)
- **usage** of mobile platforms, space technologies, etc., leading to a better implementation of the nature directives;
- the use of **aerial robotics** (in lakes, rivers, marine, forest environments).

Collection used to valorise biomass and produce high-value bio-based products:

- improved sustainable **exploitation, cultivation and processing** methods based on promising species/organisms (including complex inter-species communities), and chosen production routes;
- **biotechnology approaches** (novel natural products, e.g. chemicals, materials);
- to develop **novel/optimize sustainable** (bio-based) processes (physical, chemical parameters/stressors)

- **Invasive alien species** (HORIZON-CL6-2024-BIODIV-01-1)
[Area A: terrestrial ecosystems and/or Area B: aquatic (including marine) ecosystems]
- **Conservation and protection of carbon-rich and biodiversity-rich forest ecosystems** (HORIZON-CL6-2024-BIODIV-01-8)
- **Integrative forest management for multiple ecosystem services and enhanced biodiversity** (HORIZON-CL6-2023-BIODIV-01-15)
- **Biodiversity friendly practices in agriculture – breeding for Integrated Pest Management (IPM)** (HORIZON-CL6-2023-BIODIV-01-14)
- **Integrated assessment and monitoring of emerging pollutants in the marine environment** (HORIZON-CL6-2023-ZEROPOLLUTION-01-2)
- **Land-based bioprospecting and production of bioactive compounds and functional materials for multiple bio-based value chains** (HORIZON-CL6-2023-CircBio-01-4)
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- **Broadening the spectrum of robust enzymes and microbial hosts in industrial biotechnology** (HORIZON-CL6-2023-CircBio-01-5)

NATURE RESEARCH CENTRE (NRC)



Digital for nature (HORIZON-CL6-2024-BIODIV-01-2)

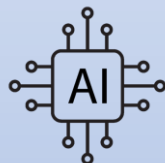
Novel digital and telemetry methods for modelling and estimation of human impact on ecosystems

Using automatic species recognition and artificial intelligence to fight illegal fish discards and revolutionise fisheries control (HORIZON-CL6-2023-FARM2FORK-01-8)

Automatic species and size recognition; artificial intelligence to analyse video footage or images obtained from different digital sources

Citizens' science as an opportunity to foster the transition to sustainable food systems (HORIZON-CL6-2024-FARM2FORK-01-6)

Citizen science as a tool to keep angling as source of sustainable food – early warning systems for target species status



Understanding and reducing bycatch of protected species (HORIZON-CL6-2023-BIODIV-01-5)

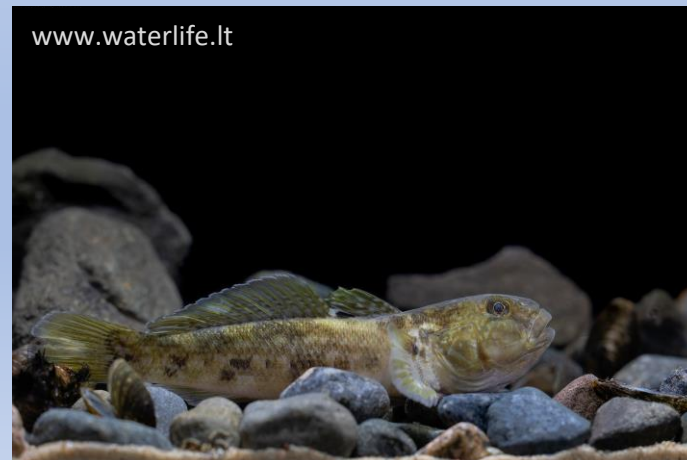
Improving the monitoring and assessment of the impact of bycatch in different fishing gears on protected and sensitive species, defining and implementing effective mitigation and management tools.

Invasive alien species (HORIZON-CL6-2024-BIODIV-01-1)

Early warning systems, public awareness, literacy and engagement on invasive alien species monitoring and management are supported and improved; understanding the drivers for invasions

Integrated assessment and monitoring of emerging pollutants in the marine environment (HORIZON-CL6-2023-ZEROPOLLUTION-01-2)

Integrated assessment and monitoring of the pathways of contaminants in the marine environment.



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Thanks
for your
attention!

NATURE RESEARCH CENTRE (NRC)



Research team and Infrastructure: Environment

RESEARCH AREA	LABORATORIES CONSTITUTING THE UoA	RESERACH FIELDS
NATURE RESEARCH	Laboratory of Chemical and Behavioural Ecology	Ecology and Environmental Sciences
	Laboratory of Evolutionary Ecology of Hydrobionts	
	Laboratory of Biodeterioration Research	
	Laboratory of Avian Ecology	
	Laboratory of Algology and Microbial Ecology	
	Laboratory of Ecotoxicology	
	Laboratory of Fish Ecology	
	Laboratory of Nuclear Geophysics and Radioecology	Geology
	Laboratory of Geoenvironmental Research	
	Laboratory of Bedrock Geology	
	Laboratory of Climate and Water Research	Physical Geography
	Laboratory of Quaternary Research	

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Research team and Infrastructure: Bio-sciences

RESEARCH AREA	LABORATORIES	RESERACH FIELDS
NATURAL SCIENCES	Laboratory of Molecular Ecology	BIOLOGY
	Laboratory of Genetics	
	Laboratory of Plant Physiology	
	Laboratory of Plant Pathology	
	Laboratory of Entomology	ZOOLOGY
	Laboratory of Mammalian Ecology	
	P. B. Šivickis Laboratory of Parasitology	
	Laboratory of Economic Botany	BOTANY
	Laboratory of Mycology	
	Laboratory of Flora and Geobotany	