REPUBLIC OF ESTONIA
MINISTRY OF THE ENVIRONMENT

REPUBLIC OF ESTONIA
ENVIRONMENT AGENCY

ASSESSMENT OF AQUATIC ECOSYSTEM SERVICES IN LIFE INTEGRATED PROJECT CLEANEST

Marko Vainu
Estonian Environment Agency, marko.vainu@envir.ee

Project CleanEst: Development of an integrated water management and its modern tools in Estonia – strategic choices for future

During a 10-year period (2019–2028) in Lääne- and Ida-Virumaa counties (Viru sub-basin):
surface water, ground water, and coastal water research will be performed;

the Erra riverbed and banks will be cleaned of residual pollution to the extent of 1.5 km;

residual pollution will be removed from Kohtla-Nõmme and Pahnimäe;

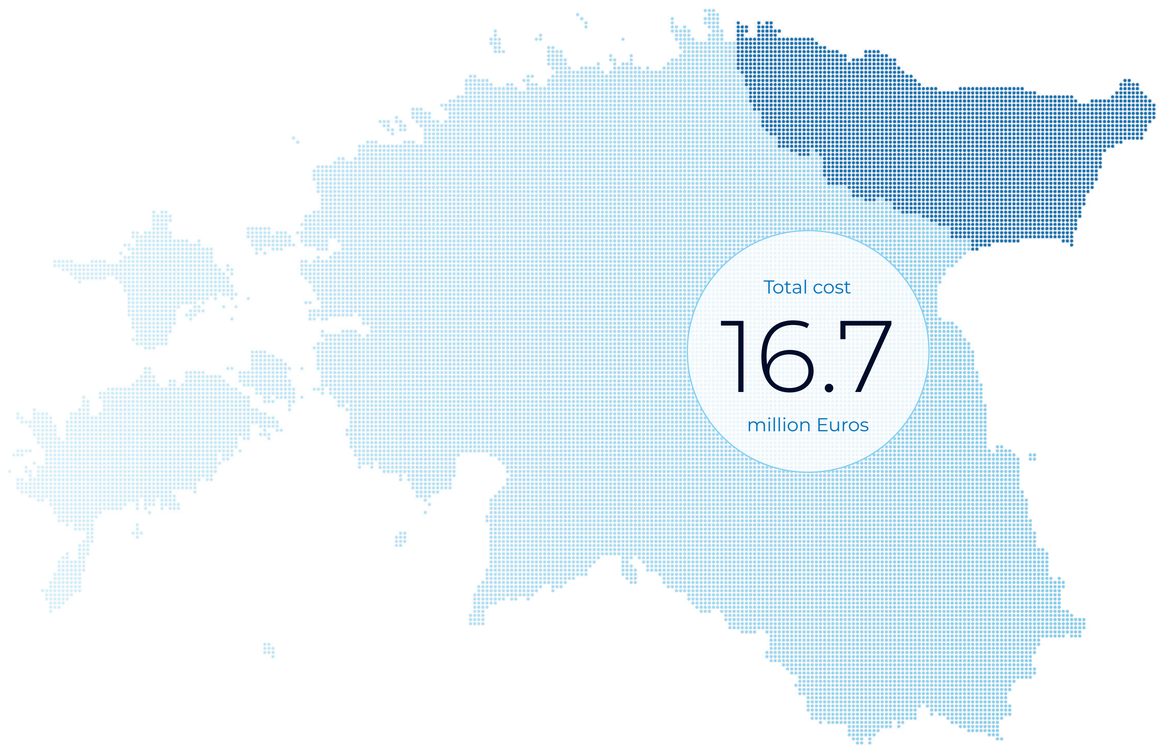
spawning grounds in the rivers will be restored;

migration routes of fish will be opened;

the Purtse river will be restocked with salmon;

methodology for assessment of water and water related ecosystem services will be refined and applied before, during and after the actions.

The project is funded by the European Commission LIFE programme and the Republic of Estonia.



Riverine ecosystem services that will be assessed:

Provisioning:
1) Fish stock for professional fishing
2) Biological material collected for the purposes of maintaining or establishing a population
3) Surface water for drinking
4) Surface water for aquaculture
5) Surface water used for non-drinking purposes
6) Surface water used as an energy source

Regulating and maintaining:
7) Maintaining nursery populations and habitats
8) Dilution and meditation of wastes or toxic substances in surface water
9) Dilution and meditation of wastes or toxic substances in groundwater
10) Hydrological cycle and water flow regulation (including flood control)
11) Maintaining drainage water discharge
12) Regulation of the chemical condition of freshwaters by living processes (buffer zones on shores)
13) Maintaining alluvial soil formation

Cultural:
14) Conditions supporting active recreation
15) Conditions supporting recreational fishing and crayfish catching
16) Conditions supporting passive recreation
17) Conditions that enable scientific investigation
18) Conditions that enable education and training
19) Conditions that enable aesthetic experiences
20) Conditions that enable creative work
21) Provision of cultural, religious and national symbols
22) Maintaining protected and rare species

Capacity/status (S), **consumption/pressures** (P) and **impact** (I) of the services will be mapped in each water body using specific indicators and the monetary value will be assessed.

A selection of **indicators** that will be used for mapping:
1) S - Number of smolts of migratory fish (pcs/yr); Fish stock (t/yr)
P - Amount of professional catch from the river (t/yr)
I - Number of people employed in professional fishing (no)

3) S - Average minimal monthly discharge that exceeds environmental flow (m^3/s), Accordance of water quality to quality requirements of water used to produce drinking water (quality class)
P - Abstraction of surface water for drinking water (m^3/s)
I - Price of drinking water produced from surface water (€/m^3)

7) S - Number of fish, macrophyte and invertebrate species in the water body (protected species have higher coefficient); Share of Annex I habitats in the 100 m onshore area (%); Ecological status according to WFD
P - Hydromorphological status; Water quality status according to WFD
I - *Not yet defined*

10) S - Number of floods that have caused insurance cases (pcs/yr)
P - Share of impermeable landcover in the 100 m onshore area (%); Amount of ditches on the floodplain (m/ha)
I - Insurance payout caused by flooding (€/yr)

14) S - Length of river suitable for canoeing/kayaking etc (km); Number of dams on the reach of the river that is suitable for that (pcs); Number of swimming places on the shore (pcs); Length of hiking trails in the 100 m onshore area
P - Number of organised canoeing/kayaking trips on the water body (pcs/yr); Number of people using the water body for swimming (pcs/yr); Number of hikers on the hiking trails (pcs/yr)
I - *Not yet defined*

18) S - Number of educational trails on the shore (pcs)
P - Number of educational field trips to the waterbody (no/yr)
I - Environmental awareness of the inhabitants of the region (index)

Leading partner Ministry of the Environment
Project's partners Environmental Board, Environment Agency, Environmental Inspectorate, Estonian Environmental Research Centre, Geological Survey of Estonia, State Forest Management Centre, Ministry of Rural Affairs, IT Centre of the Ministry of the Environment, Tallinn University of Technology, Estonian University of Life Sciences, Science Centre AHHAA, Estonian Public Broadcasting, Estonian Chamber of Agriculture and Commerce, The Rivers Trust, and the municipal governments within the Viru-sub basin.