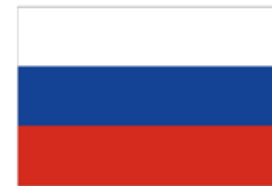




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# Seminar: “From plans to action in the case areas – Practical implementation of measures and investments”

Focus on practical implementation- and investment plans  
in Waterdrive case areas, Baltic Sea region.

*Moderated by Kaj Granholm, BSAG and Frank Bondgaard, SEGES*

STØTTET AF

**Promille**afgiftsfonden for landbrug

## Implementation- & Investment plans 10-12

Gurjevsk case area in Russia *by Irina Popova. Project manager. Administration of Guryevsk City District (Culture, Tourism and Sports Department).*

Svete river case area in Jelgava, Latvia. *by Ingars Rozitis. Project coordinator in Jelgava municipality, Latvia*

Zuvintas Reserve and agriculture case area in Lithuania *by Elvyra Mikšytė. Baltic Environmental Forum, Lithuania*

Short break

Kutno County case area in Poland *by Janusz Dabrowski Centre for Agricultural Advisory Services (CAAS) Ministry of Agriculture and Rural Development & Katarzyna Izydorzyk, Prof. nadzw. ERCE PAS European Regional Centre of Ecohydrology in Poland*

Discussion

By Kaj Granholm & Frank Bondgaard, SEGES

## Implementation- & Investment plans 13 – 15

Västervik case area in Sweden. *by Gun Lindberg & Anders Fröberg . Sustainability strategist. The Unit for Public Construction. Municipal Board Administration. Västervik (Sweden)*

Odense case area in Denmark *by Anne Sloth. Catchment officer, Velas – the farmers advisory service.*

Short break

Southern Finland drainage case area. River Porvoonjoki and Karjalaiskylä/ Gammelbacka brook

*by Mikko Ortamala. Water Management Planner, Drainage Center of Southern Finland. ProAgria Southern Finland*

Discussion

Kaj Granholm & Frank Bondgaard

# Russia



## Seminar:

# “FROM PLANS TO ACTION IN THE CASE AREAS – PRACTICAL IMPLEMENTATION OF MEASURES AND INVESTMENTS”

## THE IMPLEMENTATION PLAN FOR ENVIRONMENTAL MEASURES IN THE GURYEVSKE CASE AREA

Moderators: Kaj Granholm and Frank Bondgaard

IRINA POPOVA, Project coordinator  
ANNA ALIMPIEVA, Project manager  
ADMINISTRATION OF GURYEVSKE CITY DISTRICT

Investments in wetland construction will reduce nitrogen and phosphorus levels in the water, resulting in improved water quality in the Pond and downstream of the Gurievka River.



In the Waterdrive project, the Guryevka River catchment area was selected as the observation zone.

The catchment basin of the Upper Pond / Lake Dambas is part of the main catchment area of the Guryevka River. The selected area includes 3 drainage channels.

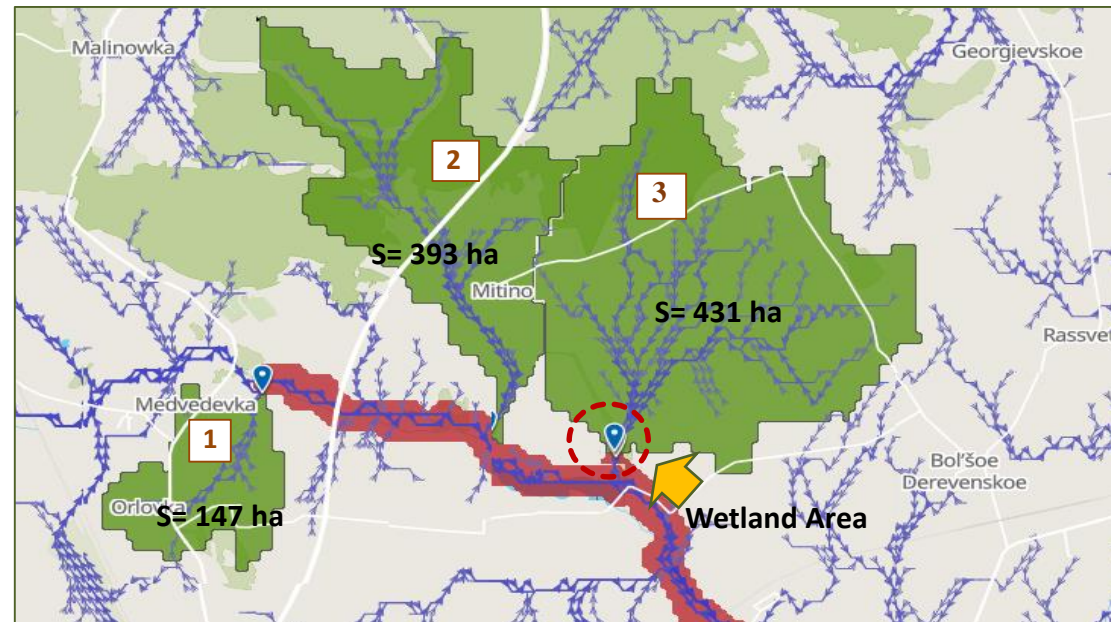
The total drainage canal drainage area is 971 ha, of which 490 ha is agricultural land.





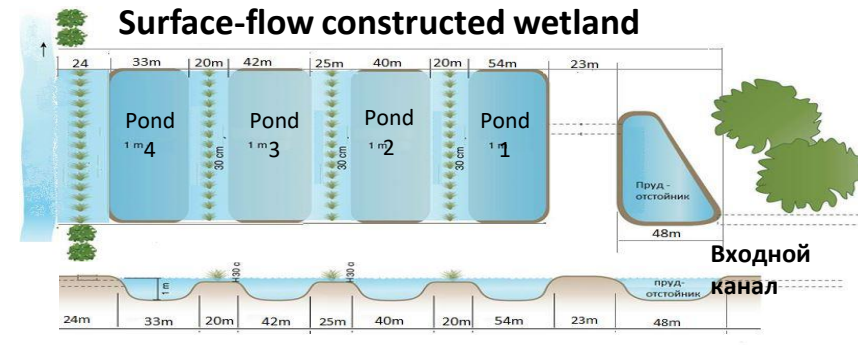
## 1. FIELD RESEARCH AND ANALYSIS OF THE DRAINAGE SYSTEM OF THE UPPER CATCHMENT AREA OF THE RIVER GURJEVKA FOR DETERMINING THE LEVEL OF THE TERRAIN RELIEF.

- Catchment drain channel **1** only includes wastewater from settlements.
- Catchment drain channel **2** includes agricultural land. But the territory does not have the road infrastructure.
- Catchment drain channel **3** includes agricultural land. The territory has a road infrastructure.
  - Flow rate: 1,07m<sup>3</sup> / s
  - The length to the pond: 3,5 km
  - Agricultural land: 251,5 ra



## 2. SELECTION OF THE TYPE AND WETLAND DESIGN

- We have studied practical examples of wetland use: Experiences from partners in Denmark, Finland and Sweden.
- The following documents have been translated: "Requirements and recommendations for the creation of mini-wetlands" and "Guide to Wetland Development for Agricultural Wastewater".
- We held consultations on wetland design with specialists from the WaterDrive project and with representatives of regional ministries of the Kaliningrad region.



IT WAS SELECTED TERRITORY, A TOTAL AREA OF - 1.87 ha

This area includes:

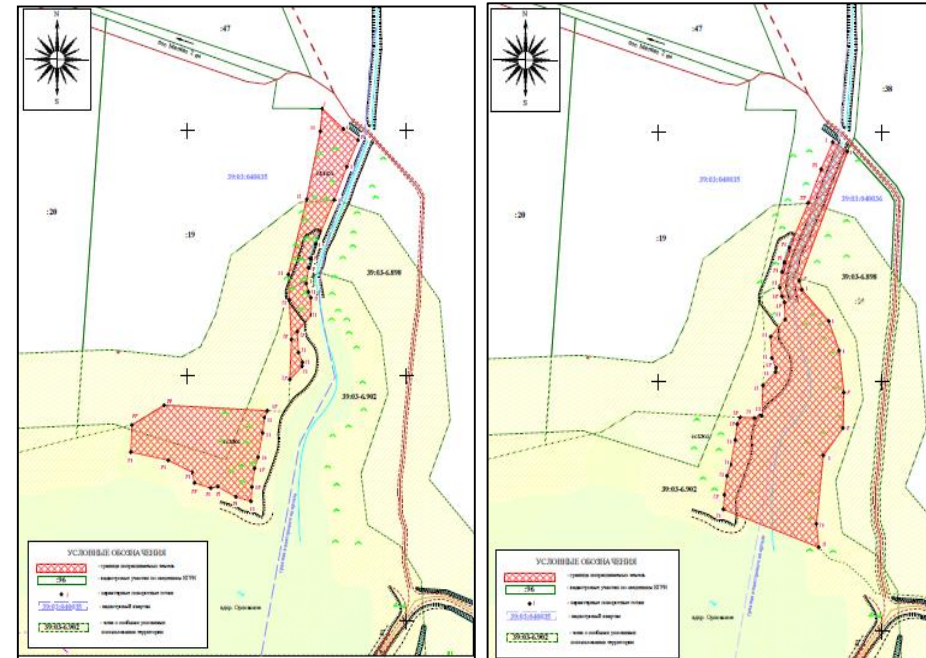
- The municipality's plots of land are the area of 0,416 hectares and 0.63 hectares (These plots of land bordering the river's and drainage canal's water protection of territories );
- Zone of drainage channel MPO-11-6a (including water protection zone of a width of 5 m on both sides of the flood);
- Zone of Guryevka River (including water protection zone width of 20 m on both sides of the watercourse





#### 4. INITIATED ISSUES ASSOCIATED WITH LAND RELATIONS AND THE PROCEDURE FOR OBTAINING BUILDING PERMITS

- The boundaries of the site have been established, and also a water protection zone and coastal protective strip boundaries.
- FGBU "Kaliningradmeliovodkhoz" has agreed of modification the channel bed within the boundaries of municipal lands.
- The Land Department issued permit No. 280 of 07-08-2020 for the use of state-owned and municipally owned land for a period of 5 years.



## 5. A MONITORING PROGRAM HAS BEEN DEVELOPED

The following steps have been taken in order to obtain a Decision on the use of the water body from the Ministry of Natural Resources and Environment:

- The program of water-object monitoring and was developed morphometric research on the spot of building the wetland was carried out.
- The results of chemical analysis of natural waters above and below the Wetland construction site were obtained .
- Assessment of the nutrient load of Guryevka basin is ongoing (the research is being carried out by the BIEG Institute (AO13) in accordance with the municipal contract). The works are planned to be completed by the end of 2020.



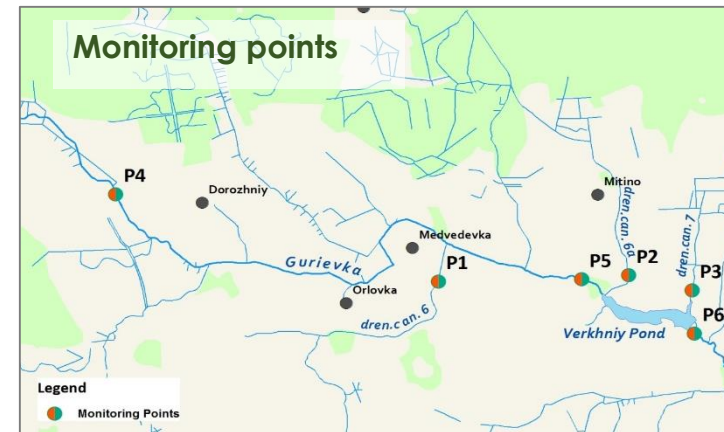
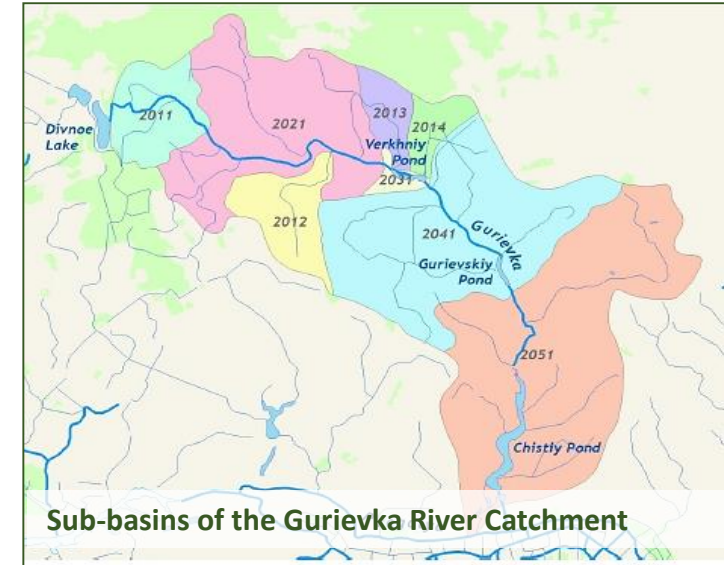


## MONITORING PROGRAM

### Research results:

- the pollution does not exceed the standards required for fishing;
- the nitrogen content is higher in drainage channels and lower in the riverbed, phosphorus content - the opposite.
- The full report with all the data will be provided later.

The HYPE (HYdrological Predictions for the Environment) model developed by the Swedish Hydrometeorological Institute (SMHI) was used for the calculations.



## 5. MAIN RESULTS OF THE FOCUS GROUPS IN CASE AREA

We continue to work with farmers, the advisory service, the municipality and other stakeholders.

5 farmers in our case area:

- 1 large farmer, 4500 ha, winter wheat and rapeseed, he is also engaged in land reclamation
- 4 small farmers, 50-200 ha, vegetables (potato, carrot, beetroot, cabbage)
- All farmers face flooding of parts of their land
- 2 farmers face soil acidification
- 2 farmers (1 large and 1 small) took part in a state program for the subsidy of land reclamation



## PROSPECTS FOR INVOLVEMENT IN THE PROJECT AND FURTHER WATER MANAGEMENT MEASURES IN THE CONTEXT OF REGIONAL POLICIES ON LAND RECLAMATION

The regional budget subsidizes costs of agricultural producers for rehabilitating and maintaining amelioration facilities.

Subsidies are allocated for the following purposes:

1. Subsidies to agricultural producers to compensate partly the costs associated with crop handling and technical work on land involved in agricultural turnover;
2. Subsidies for partial reimbursement of the costs associated with of acidic soil liming on arable land;
3. Subsidies for covering part of the costs for hydro reclamation activities;

**The subsidy amounts to 70 % of the actual costs**



### SHORTCOMINGS OF THE SUBSIDY PROGRAM:

- The procedure of a subsidy receiving is long and complex ;
- Subsidies are not suitable for small farmers and small and scattered areas;
- The subsidy program on soil acidification problem supports only Russian remedy using;

### KEY FACTORS OF SCANT FARMERS' INVOLVEMENT INTO WATERDRIVE PROJECT

- Their low ecological awareness, including the fields of water management and wetland constructing;
- Low motivation for introducing ecological measures in agriculture related to the absence of relevant priorities in public policy, regulatory requirements and supporting measures together with high cost of their introduction;
- The absence of providing by the government incentives for eco-friendly measures in agriculture, land reclamation, rural lands development;
- The lack of existing support programs, especially regarding small farmers.



### PROPOSED MEASURES:

- Ecological educational programs for farmers and other groups, including issues of water management and wetlands as its tool;
- Establishing of educational actors' pool, creating Regional Information Resource Center on the water management issues;
- Stimulation of scientific research and also spreading advanced approaches to eco-friendly farming among the farmers;
- Development and implementation of governmental measures of stimulating farmers in the field of ecological measures;
- Creation of Wetland-park with research and educational center



In the framework of the existing state programs, about 50 mln EUR of the federal funds have been allocated to finance reclamation works in 2019-2025.

The government of the Kaliningrad region annually finances repair works of the regional land reclamation systems.

**In 2019**, carried out the following repair works for paid from the federal budget:

- 722 km of main canals and water receivers;
- 85 km of flood dams;
- 12 pumping stations.

These works have improved the ameliorative condition of 7,400 hectares and reduced the acidity of 6,800 hectares of agricultural land.

**In 2020**, it is planned to restore the amelioration network with a total length of 400 km (open inter-farm canals and closed drainage networks)



**Next steps:**

1. Prepare tender documents for the development of design and estimate documentation (Sept/ Oct );
2. Hold a tender (Oct.2020);
3. Develop design and estimate documentation for Wetland construction (Oct. 2020-Jan. 2021);
4. Get the Decision on Use of the Water Object from the Ministry of Natural Resources. Feb. 2021
5. To promote knowledge about the project, the importance of wetlands and the use of best practices (FB, website administration);
6. Continue conversations with farmers (individual and focus groups);



**Thanks for attention !**

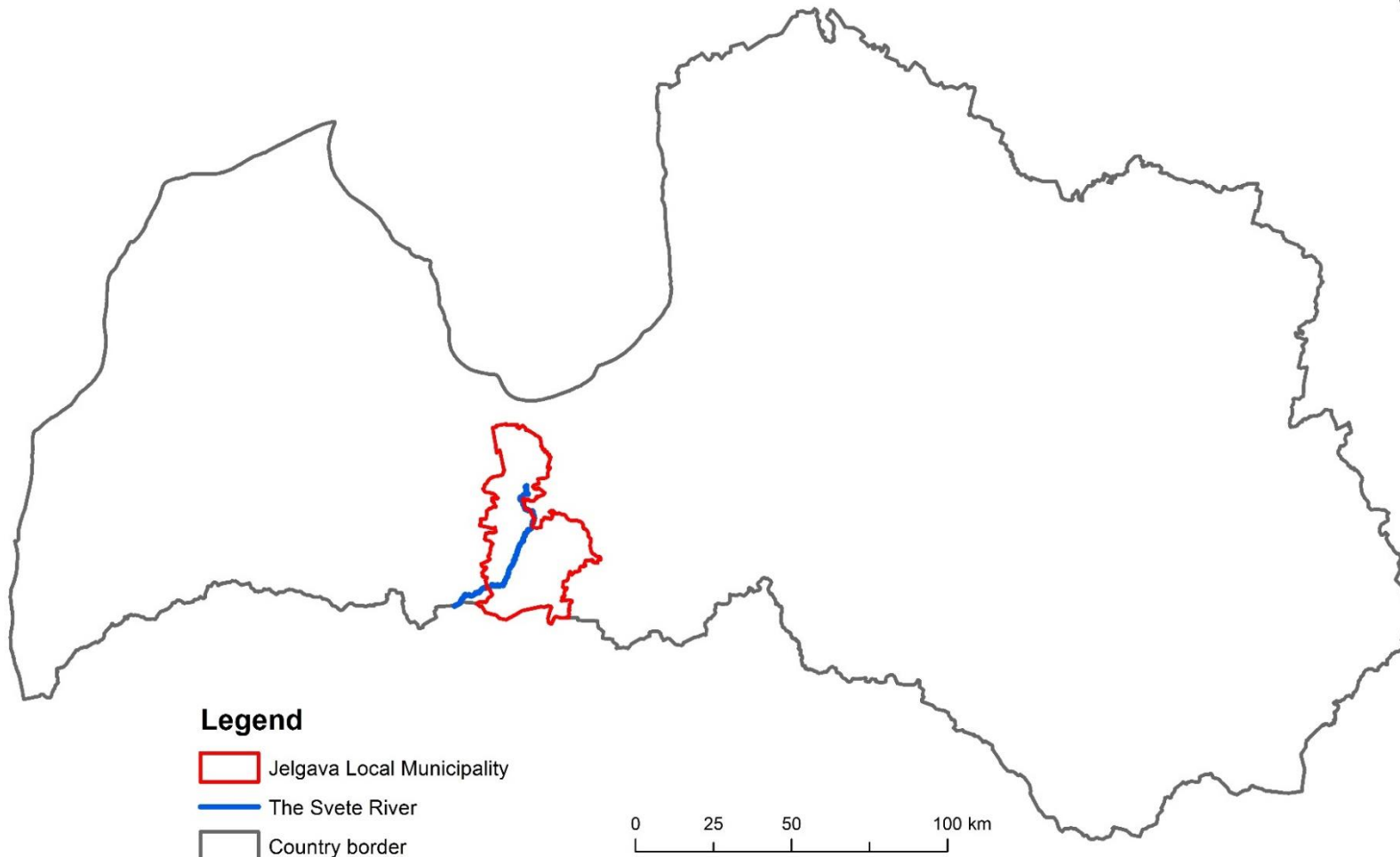
# Latvia

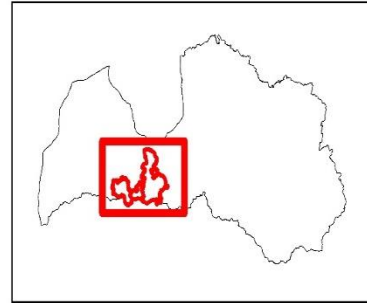
## From plans to actions in the case areas

21.10.2020, Jelgava

Ingars Rozītis  
Jelgava local municipality  
drainage expert





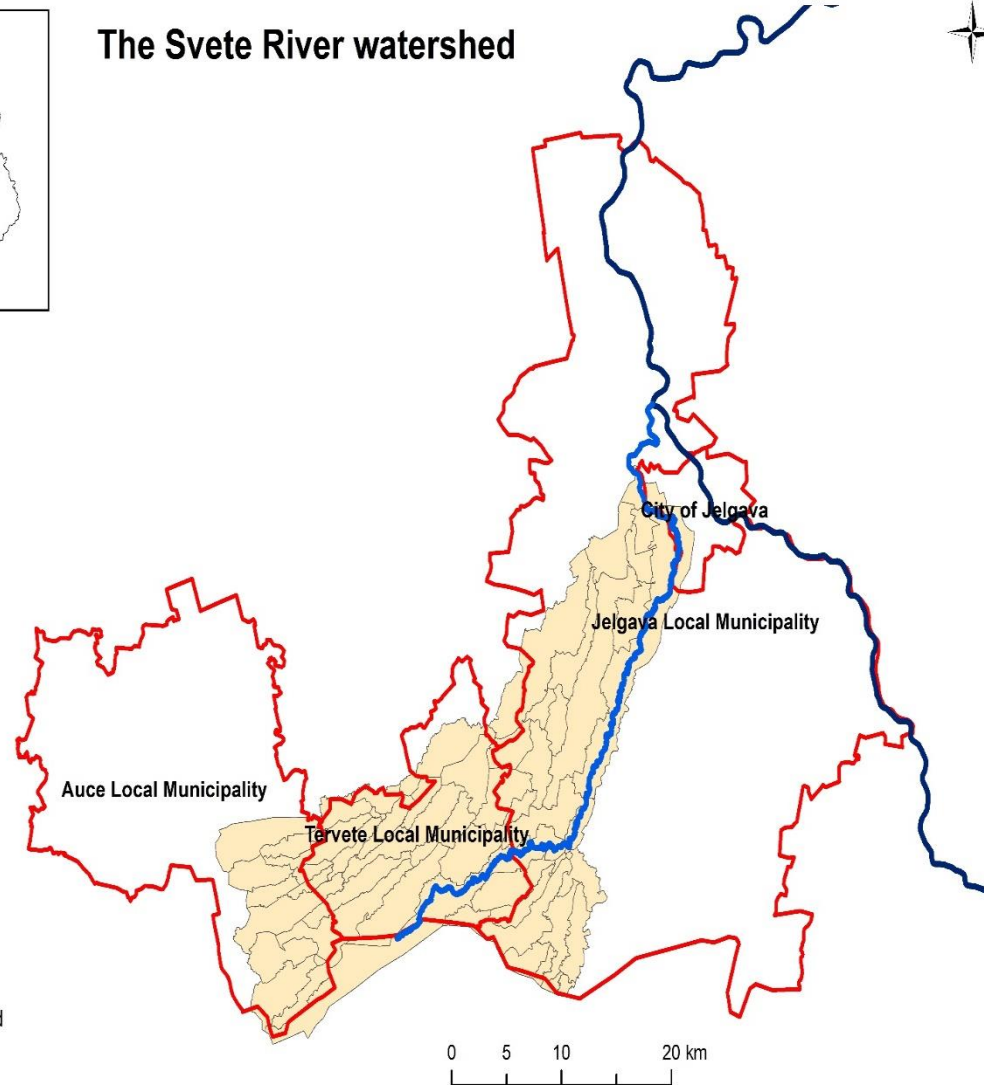


## The Svete River watershed



### Legend

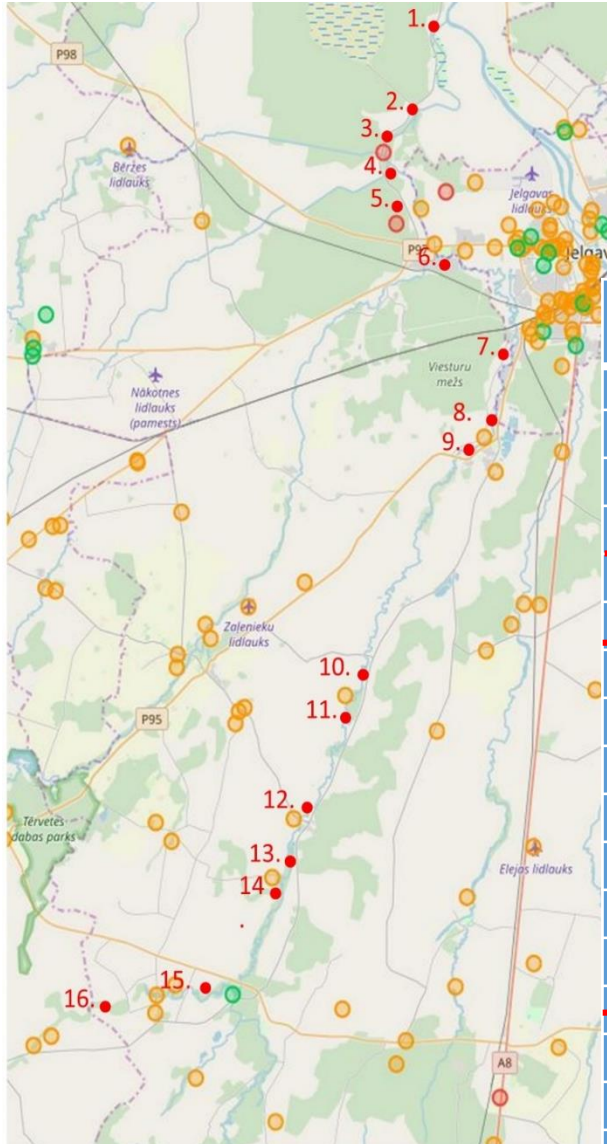
-  The Svete River
-  The Lielupe River
-  Local Municipality
-  The Svete River watershed



## Definition of catchment as pilot area

- Collected data studies about water quality in Svēte river in Jelgava local municipality district,
- Research of historical maps,
- Data collection from available maps (GIS services) and aerial photo maps from 1995-2019,
- Detecting of places with intensive farmland indicators – more than 60% of fields in catchment area used in crop production,
- Fields generally drained by subsurface drainage.
  - River water quality,
  - Identification of management principles and challenges

## Monitoring results in Svēte river



### Nitrogen (N) concentrations

### Phosphorus concentrations

Point No.	Min value	Mm onth	Max value	Month	Point No.	Min value	Month	Max value	Month	Average value
	mg/l		mg/l			µg/l		µg/l		µg/l
1.	0.2	july	52.7	february	1.	41.00	March	433.81	June	90.47
2.	0.2	july	51.8	february	2.	43.00	April	177.12	June	91.43
3.	0.2	july	52.5	february	3.	43.00	april	361.70	September	107.86
4.	0.2	july	54.6	february	4.	29.06	December	314.68	November	94.90
5.	0.2	july	52.2	february	5.	31.17	November	363.54	June	106.29
6.	0.2	july	54.3	february	6.	27.87	March	106.13	August	55.39
7.	0.2	july	52.2	february	7.	33.71	December	68.58	June	51.65
8.	0.2	july	52.4	february	8.	32.15	November	136.23	June	62.43
9.	0.2	july	52.6	february	9.	24.88	July	73.24	October	42.98
10.	0.2	july	51.9	february	10.	17.47	September	57.00	February	30.93
11.	0.2	july	55.9	february	11.	25.40	September	104.20	December	48.43
12.	0.2	july	51.7	february	12.	17.77	September	54.00	February	34.02
13.	0.2	july	55.1	february	13.	24.76	September	314.97	July	68.24
14.	0.2	july	53.6	february	14.	16.38	September	71.00	January	37.95
15.	0.2	july	54.4	february	15.	20.66	May	83.40	June	42.53
16.	0.2	july	53.6	february	16.	34.48	November	71.41	October	52.49

## Objectives of the pilot case

- Evaluation of current status of the river bassins with flooded meadows:
  - Situation of flooded meadows,
  - River water quality,
  - Identification of management principles and challenges
- Development on the practical situation based recommendations for win-win solutions on flooded meadow management
- More knowledge on how to introduce result - and valuebased support schemes. Test ideas, including collective approach, in a practical context, with farmers and local stakeholders.
- Increased knowledge and openness of farmers'/ land owners' to the collective approach activities for water management practices: ditches management, drainage system construction, bufferstrips, etc.
- Policy recommendations, on possible valuebased activities and support schemes for sustainable and responsible management of flooded meadow territories
- Developed guidelines for all involved stakeholders, for collective watercourses and flooded meadows management

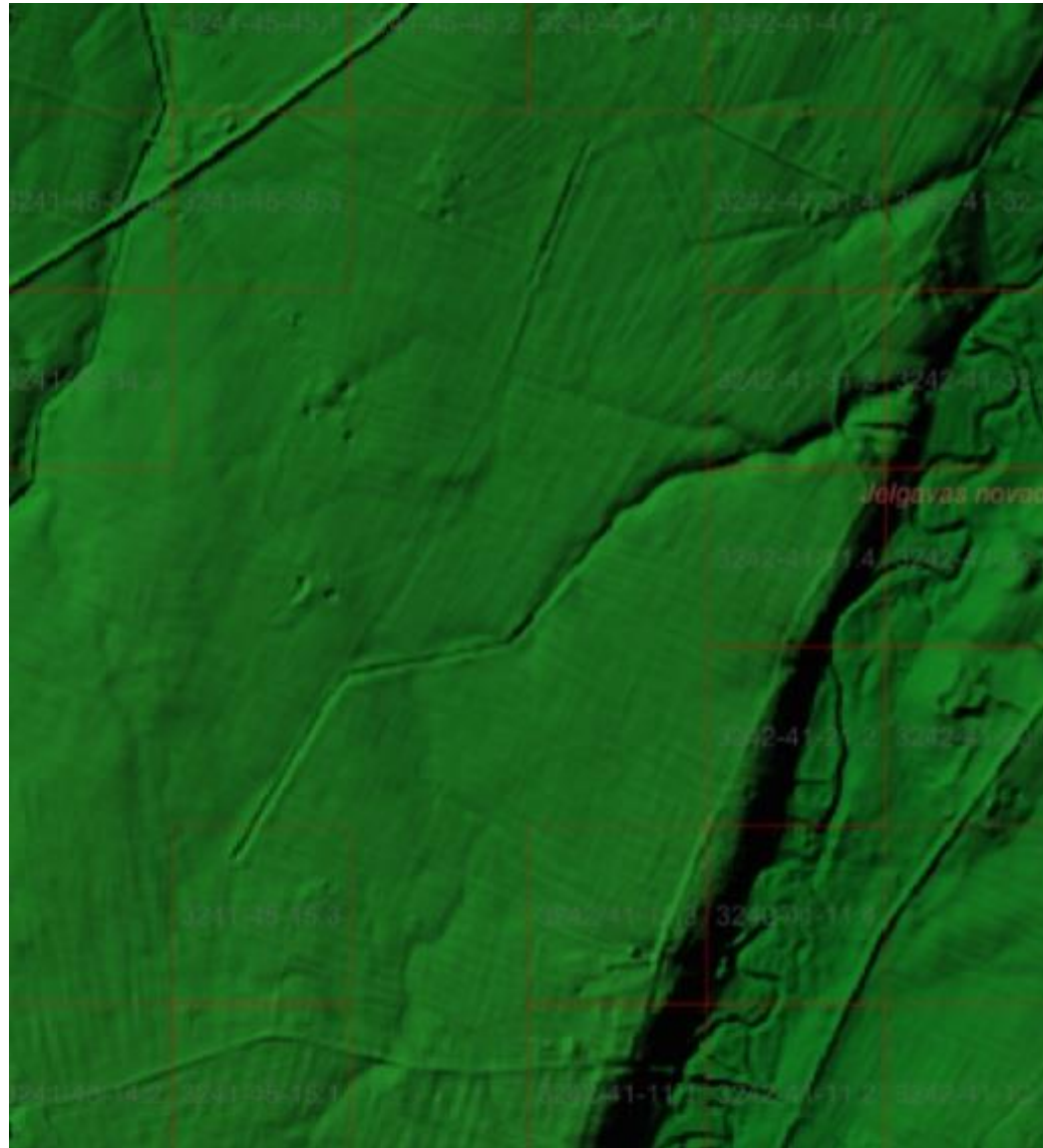
## Stakeholders to be involved and their roles

- National, regional and local authorities;
- Research institutions, experts:
  - on water management and quality
  - on biological diversity
  - on economical, rural development and management aspects.
- Farmers and local land owners in selected area and around selected area – main role in case study, possible input for design, implimentation of actions and methods
- Socially active local population representatives/ “mind leaders”
- Possible/ potencial municipal land (*flood area*) tenants – agricultural landscape, grazing etc.

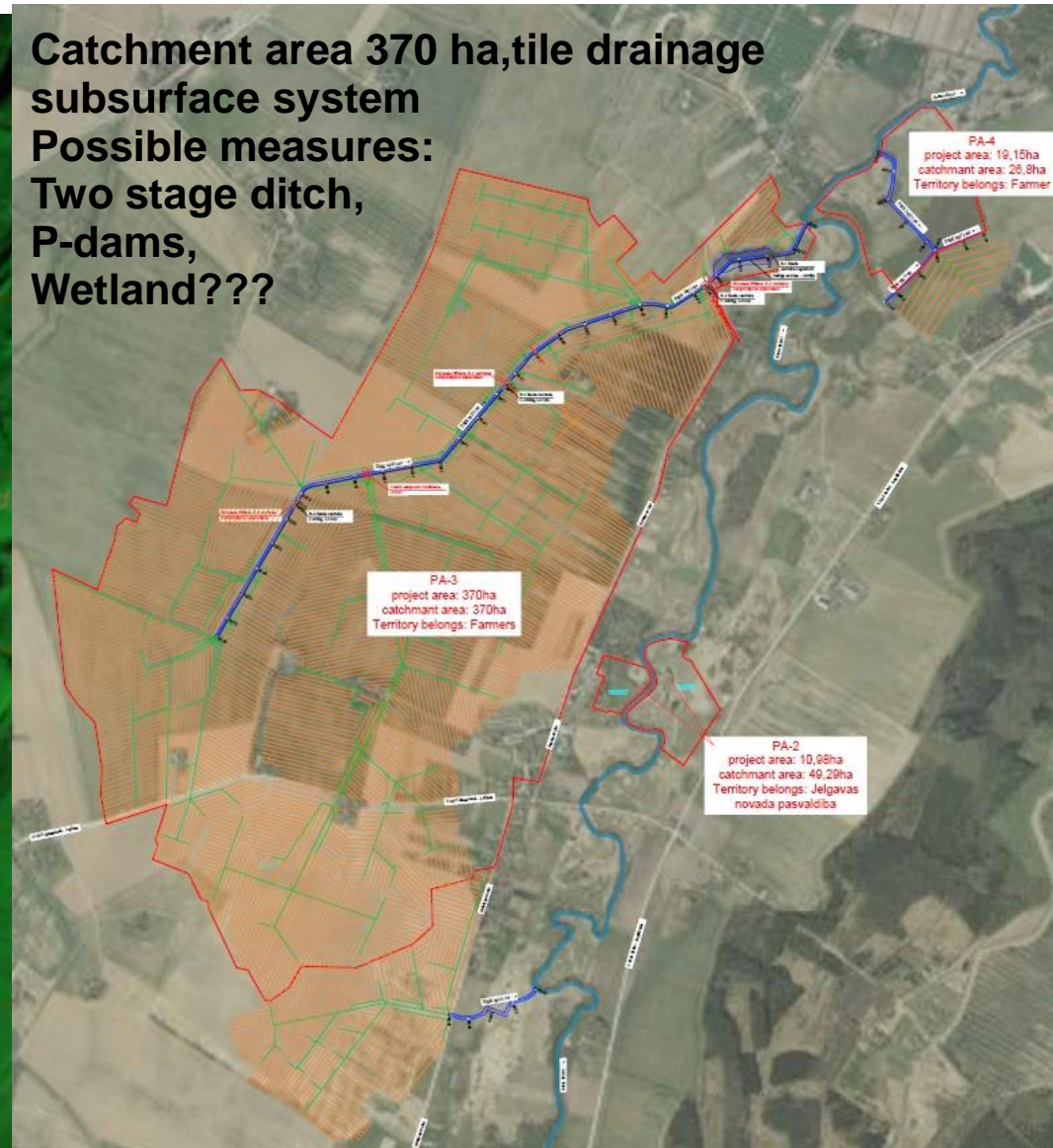


## Expected results of the pilot case

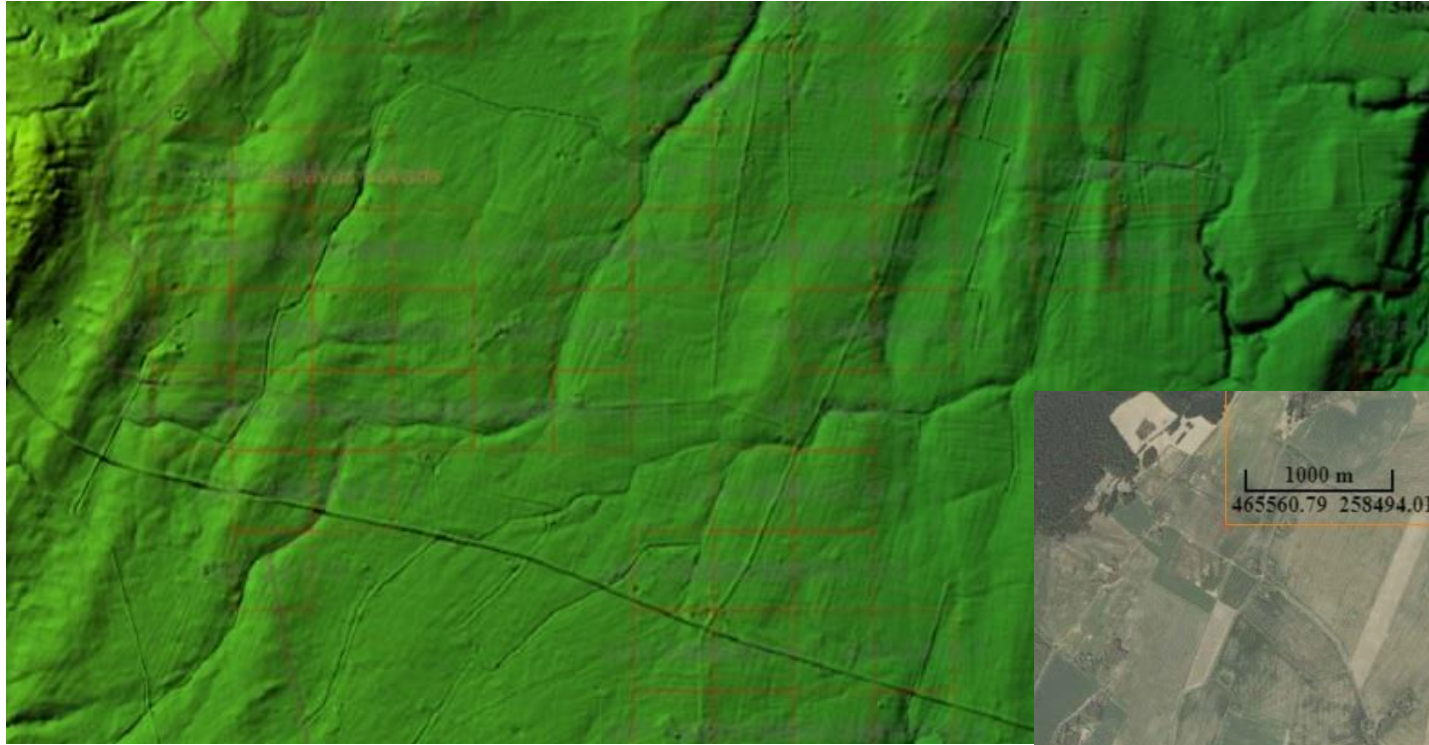
- Developed recommendations/ policies for possible support measures for flooded meadow management:
  - Payment based support
  - Collective approach support
  - Tax incentives
  - Rental allowances for publicly owned land rent
  - Etc.
- Elaborated collective approach system principles for management of floodplain part of the river coastline;
- Recommendations for shifting of support schemes from management based to result based
- Policy recommendations for reduction of administrative burden
- Recommendations for targeted placing the right measure in the right place
- Increased knowledge about designing payment schemes and using digital tools and models



**Catchment area 370 ha, tile drainage  
subsurface system**  
**Possible measures:**  
**Two stage ditch,**  
**P-dams,**  
**Wetland???**







**Catchment area 1492 ha, tile drainage  
subsurface system  
Possible measures:  
Two stage ditch,  
P-dams,  
Inteligent buferzone**





## Environmental measures in case area



**Place for sedimentation pond:  
Catchment- 234ha,  
Possible measures for  
implementation under discussion**



## Environmental measures in case area



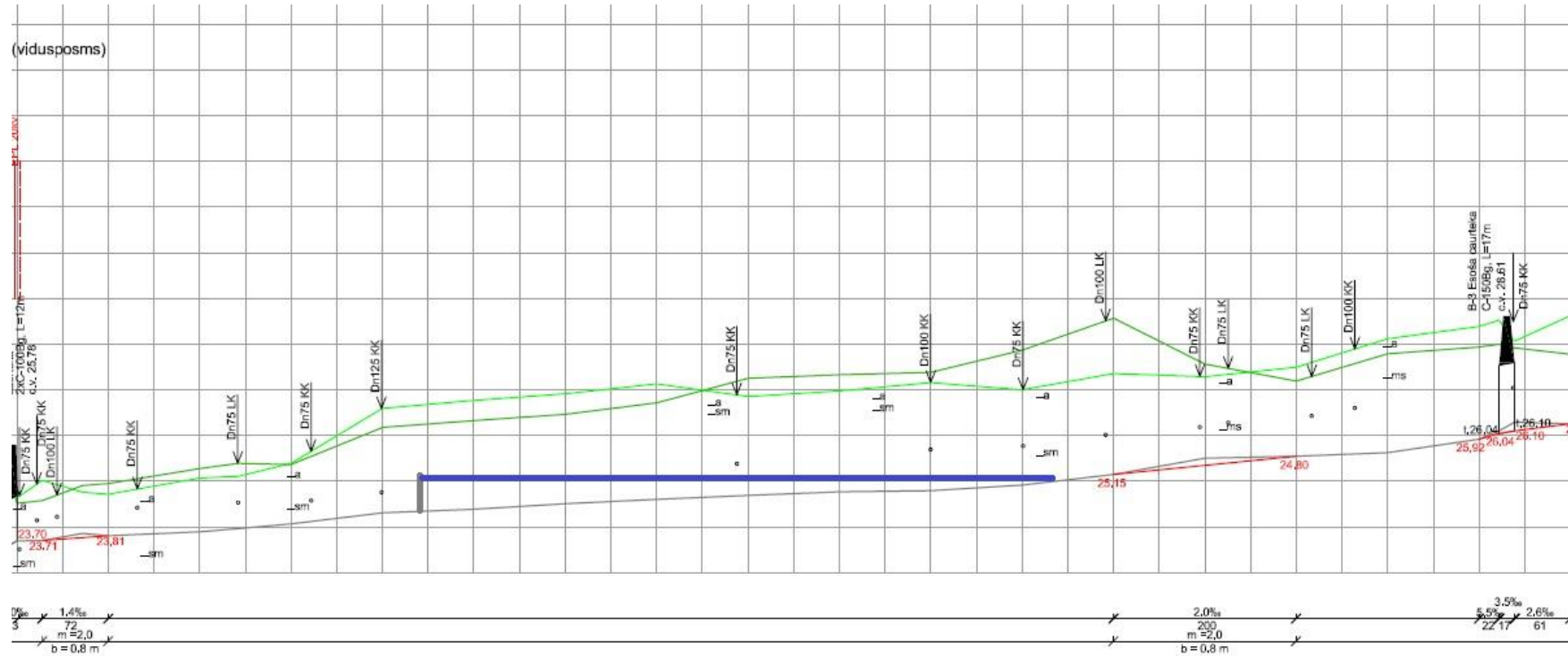
**Intelligent buferzone:**  
Catchment- 34ha,  
Ditch lenght -210m

Source:<http://www.go-gris.dk/nyheder/2017/intelligent-bufferzone.aspx>

**Investments – 2000 to 3500 EUR:**

- Bush cutting and repealing – 0,24ha
- Excavation works - 1240 m<sup>3</sup>
- Ground leveling – 800 m<sup>3</sup>

## Environmental measures in case area



**Phosphorus retention dam possible  
place:  
Near to drain discharge pipes**

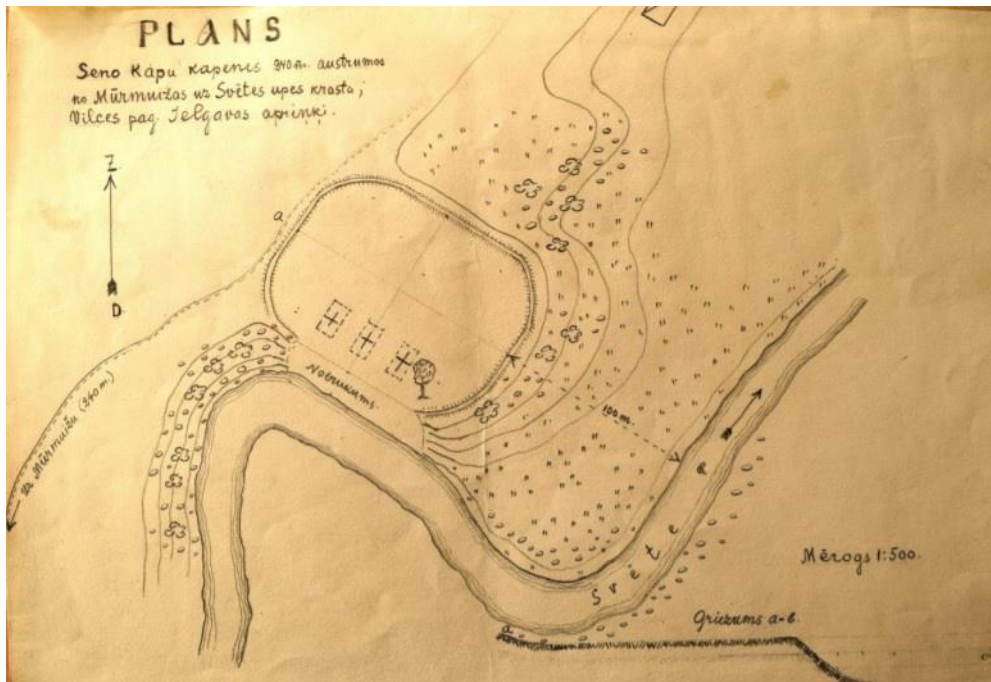


## Development of designing project

Development of designing project for erosion prevention in Mūrmuiža ancient cemetery  
- Swedish war cemetery from battle 16th of June 1705. (WP5)

- The cemetery placed near to Svete river,
- After erosion caused landslides the part of burials uncovered

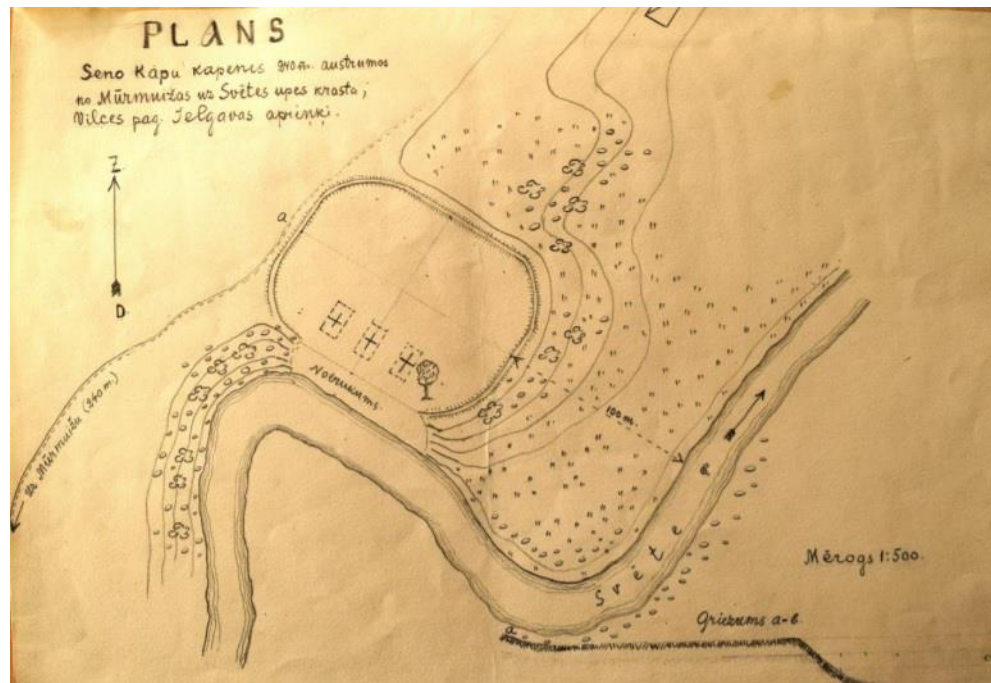
Designing project for clean out of «bottle necks» in Svēte river preventing of flooding risks.





## Development of designing project

Designing project for clean out of «bottle necks» in Svēte river preventing of flooding risks



*Practical actions for holistic drainage management for reduced nutrient inflow to Baltic Sea*

***Thank You!***

Ingars Rozītis  
Jelgava local municipality  
drainage expert  
e-mail: [ingars.rozitis@jelgavasnovads.lv](mailto:ingars.rozitis@jelgavasnovads.lv)

# Lithuania



*Waterdrive*

# CASE STUDY & POTENTIAL ACTION PLAN

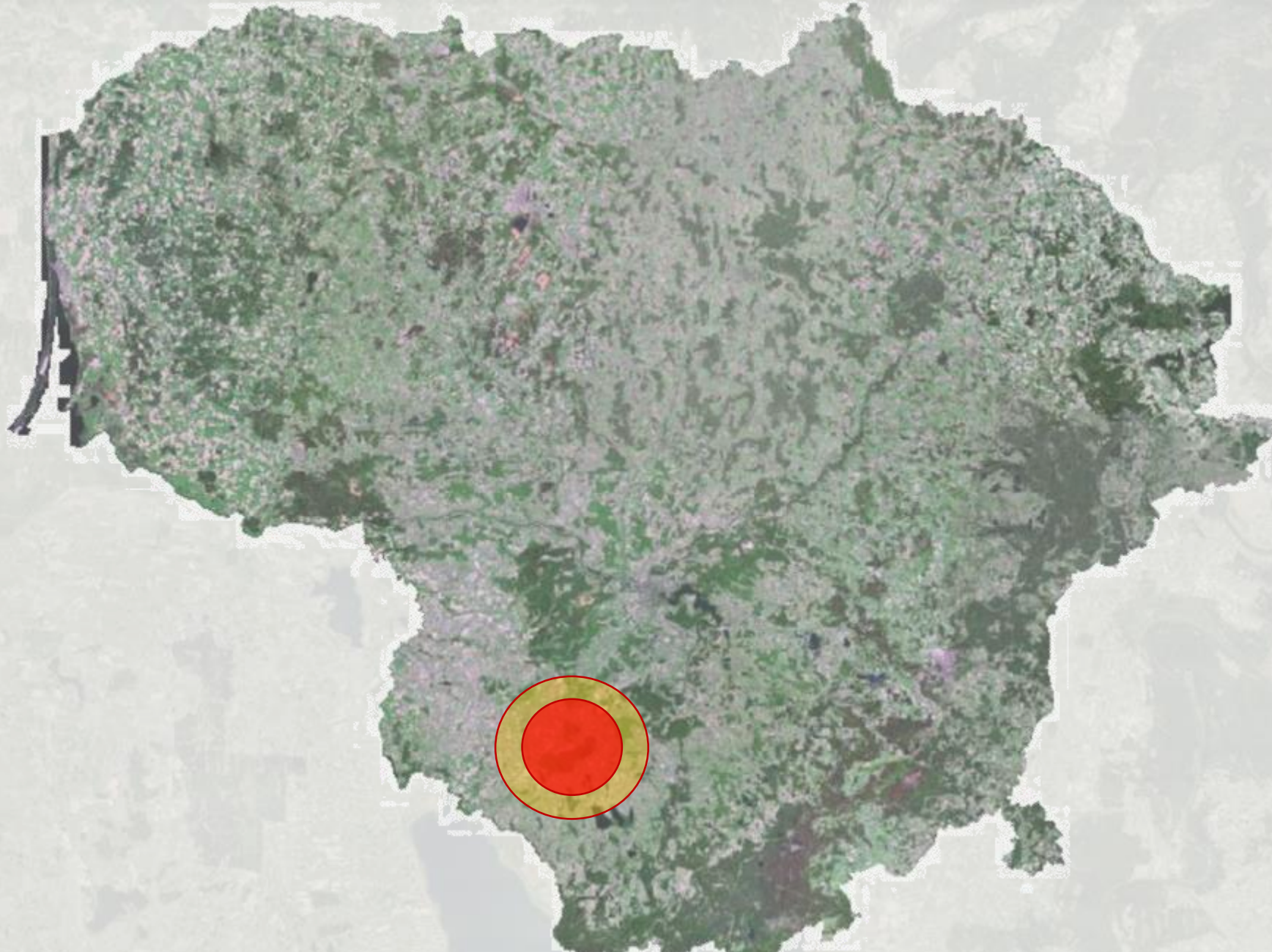


ELVYRA MIKŠYTĖ  
BALTIC ENVIRONMENTAL FORUM



EUROPEAN  
REGIONAL  
DEVELOPMENT  
FUND







# WATERDRIVE in Lithuania

Dovinė river catchment

**Focus:**

Žuvintas Biosphere Reserve and surrounding areas







# Case study actions

- Many separate meetings with stakeholders:
  - Experts, Žuvintas BR Directorate, municipalities, ministries, people with experience and knowledge in the case area, Meteliai RP Directorate, etc.
- Searching for allies and communities
- Water quality measurements
- Focus group with farmers in March, 2020
- Survey of municipalities and farmers
- Contact with Ministry of Environment and Ministry of Agriculture and dialogue established on water protection measures in CAP

# What we found out

Focus group with farmers in March, 2020:

- Low awareness impacts on local water quality
- Low personal gain from water quality measures – low motivation to implement
- No local concern or active groups/initiatives addressing water quality question



# What we found out

Controlled drainage the most feasible measure for farmers:

- High impact on water pollution reduction
- Financially adequate, fast payback
- **Not feasible in case study region due to hilly landscape**

Water quality measurements show:

- No significant pollution detected from agriculture on the catchment level (doesn't mean that it is not there)
- Potential pollution from household wastewater
- Hydrological imbalance due to fishery pond activity
- More measurements needed to draw conclusions



# Plans for 2021

- Continue water quality monitoring and result analysis
  - Feedback results to Žuvintas BR Directorate, farmers and communities
- Meeting with fishery pond managers to investigate impacts and strategies for the future
  - Contact with other stakeholders and Swedish partners to investigate possible impacts and solutions (if possible)
- Meeting with local action groups and promote and inspire local environmental and water management actions
- Meeting decision-making stakeholders to discuss best-practice measures and potential to implement in LT



# Potential action plan directions

After finishing the monitoring programme:

- Identified potential pollution sources and **if possible** solutions for reduction
- Develop recommendations for further monitoring
- Calculate financial resources needed for further monitoring to pin down pollution sources

Identified best-practice water management solutions that would have higher potential to get implemented in the case area or nationally

**Potentially:** impacts of fishery ponds (we need to further investigate to identify and know how to address the impacts)

# Poland

# Poland Catchment Area activities

21-10-2020

CDR

Poland



# Double approach



- **Catchment level**

ERCE - intervention on catchment area.

- **New type of agricultural advisory**

CDR - focus on individual agricultural advisor  
area of operation

Not catchment - administrative level of  
country/commune



# Agricultural advisory level

- ▶ National network of public/private agricultural advisory services - production oriented support and assistance in meeting of growing pile of regulatory requirements,
- ▶ Water supply perceived as „obvious” (except hot season happening in farming on regular basis),

# Agricultural advisory level

To avoid creation of new type of advisors like army without capacity to deliver:

- ▶ to give advisors tasks without expertise and financial capacity to deliver,
- ▶ to force them to operate in institutional vacuum - lead to frustration due lack of ability of delivering services expected by farmers/rural communities and other key stakeholders.

# Agricultural advisory level

- ▶ ToR and training materials for new type of services delivered by team of external experts.
  - ▶ ToR for new type of agricultural advisory services
- 
1. To have in depth knowledge on legal regulations concerning key issues related water management in agriculture/farming practice.
  2. To have practical, updated information on sources of funding for initiatives/investments related to water management in agriculture/farming practice.



# Agricultural advisory level

- ▶ Cycle of training for group of 30 agricultural advisors delivered - September/October 2020.
- ▶ Currently review of questionnaires submitted by advisors participating in the training.
- ▶ Work out final proposal regarding scope of training for future water agricultural advisors.

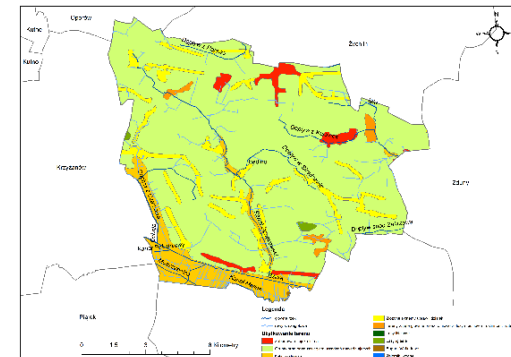
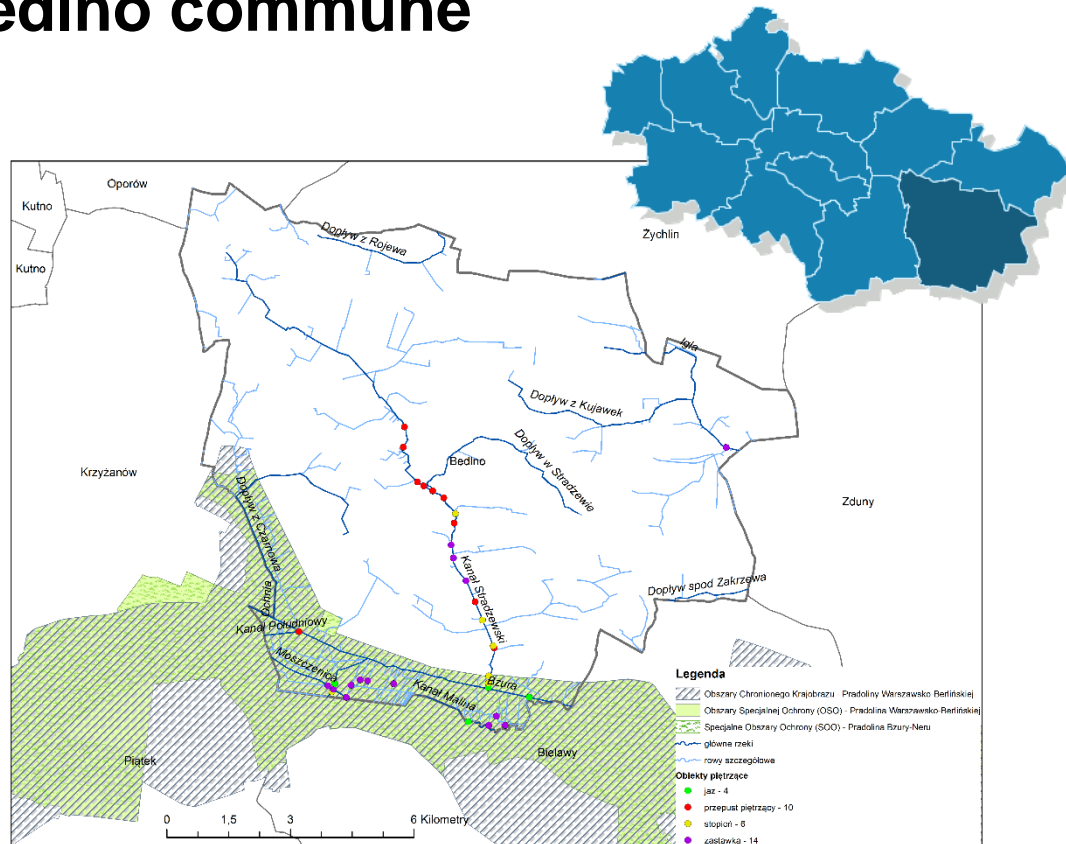
Unknown factor: future of CAP after 2021/role of agricultural advisors in Poland?

# Agricultural advisory level

- ▶ Final report of new type of services will be submitted to the key decision maker - Ministry of Agriculture and Rural Development.
- ▶ To meet demand from advisors for new cycle of training - to identify funds for additional trainings for advisors requesting participation in water advisor training (mirroring growing concerns of all agricultural actors and stakeholders regarding supply of water for agricultural production).

# Kutno County, Poland

## Selected implementation area: Bedno commune

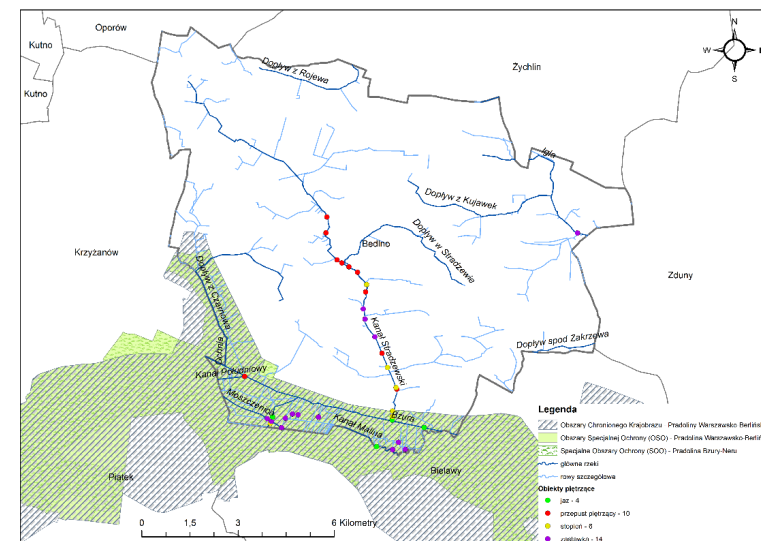




## Main task: Development of Action Plan for improvement of water retention for the Bedlno commune with suggested investments, and funding sources

Increased water retention is possible through:

- (1) cooperative renovation and management of **the drainage system** to slow down water outflow,
- (2) using **good agricultural practices** to increase soil water retention, and
- (3) optimization of the **landscape structure** for regulation of water cycle.



## Step 1. Long preparatory phase

Co-organization and participation in regional meetings on water management in agricultural areas



13 June 2019, Łódź



20 August 2019, Łódź



13 November 2019, Łódź

Conclusion: **Lack of cooperation** between the water management authority and farmers/water companies in the planning and implementation of investments and maintenance works in the drainage areas

## Step 2. Joint identification of problems and solutions with farmers and water authority

### 1st Local WATERDRIVE Meeting, 6th Feb. 2020, Bedlno

#### 45 participants:

Ab. 20 farmers from testing area (water company, farmers, community council),  
5 representatives of National Water Holding 'Polish Waters' (local, catchment, regional and national level), water companies and local authorities from Kutno County, regional authorities, agricultural advisors, experts



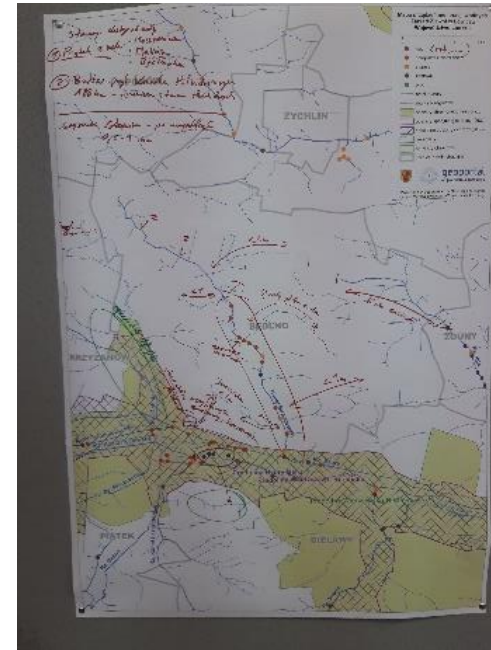


## Interactive workshop:

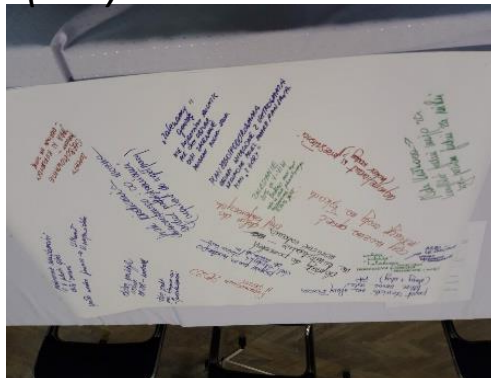
- the selection of the area to demonstrate water retention increase through controlling the outflow from drainage system (the so-called **river channel retention**)
- the possibilities and limitations of the implementation of targeted **agricultural practices** (catch crops, deepening, selection of the sowing direction) and **landscape shaping measures** (buffer zones, afforestation, mid-field bushes and trees, wetlands).



## Reactive measures



## (Pro)Active measures





## Step 3. Recognising the acceptability of environmental measures by farmers

**2nd Local WATERDRIVE Meeting, 21 May 2020, Bedlno**

**8 participants:**

5 farmers (water company, community council, local authority) and regional authority, experts



## Measures

## Farmers's acceptability

Establishing shelterbelts

-/+

Afforestation of selected, unproductive lands

--

Establishing and protection of ecotone meadows  
and wetlands

+

Cultivation of catch crops and soil embedding crops  
(intercropping)

++

Protection / establishing small water bodies

++

Reconstruction of drainage systems towards  
amelioration of soils - controled drainage system

+++



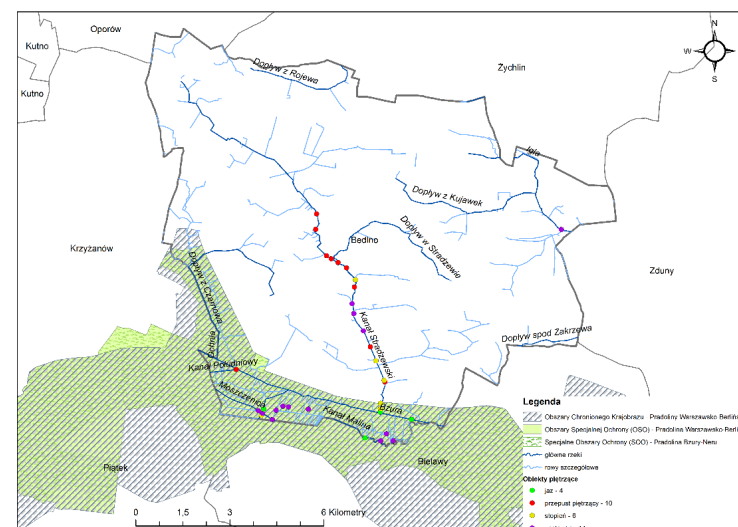
## Step 4. Co-design of new water damming system both on state and private lands

### 3rd Local WATERDRIVE Meeting

PGW Wody Polskie Zarząd Zlewni w Łowiczu, 23 July 2020

### 12 participants:

regional water management authority, local water management authority, farmer  
from water company, local authority, regional authority, experts





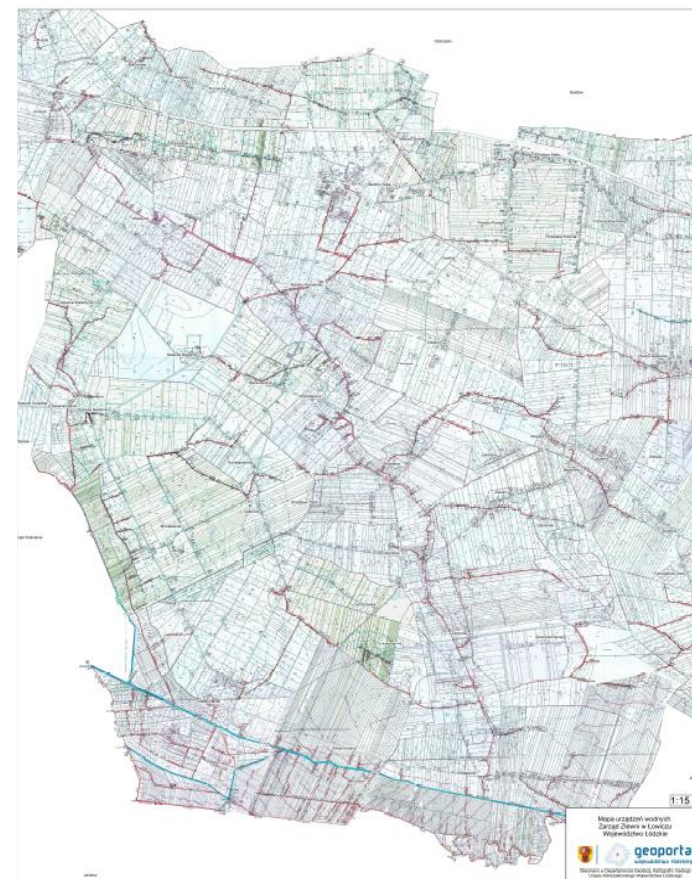
„Analysis of the possibility of regulating the drainage outflows for the Stradzewski Channel in order to increase water retention in the landscape and groundwater restoration” – report will be developed



*PHOTOS: Joint operation on existing hydrotechnical infrastructures by Polish Waters and Bedlno water company facilitated by the Lodzkie Marshal Office, April/May 2020*

## Barriers:

- Broadly available maps are not sufficient for drainage-related technical documents
- Availability of paper maps (1: 2 000) being part of 1960-1970 documentation, they are spread among archives, water companies and farmers
- Lack of financial programs to support the stage of preparation of technical documentation
- No successors of designers/persons with the mandate and skills to carry out drainage-related technical documents
- Legal issues of damming facilities and water damming are changing and require individual analysis





## next:

Participatory mapping of potential areas increasing landscape water retention in Bedlno Commune (mid-field bushes and trees, wetland, buffer zones, small ponds).





# Sweden

# WaterDrive

## Investment plans and results

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Anders Fröberg  
[anders.froberg@vastervik.se](mailto:anders.froberg@vastervik.se)



## Status about the work in the Waterdrive case area

- Investment and Implementation plans
- Calculation of costs of environmental measures
- Cooperation structures in case area



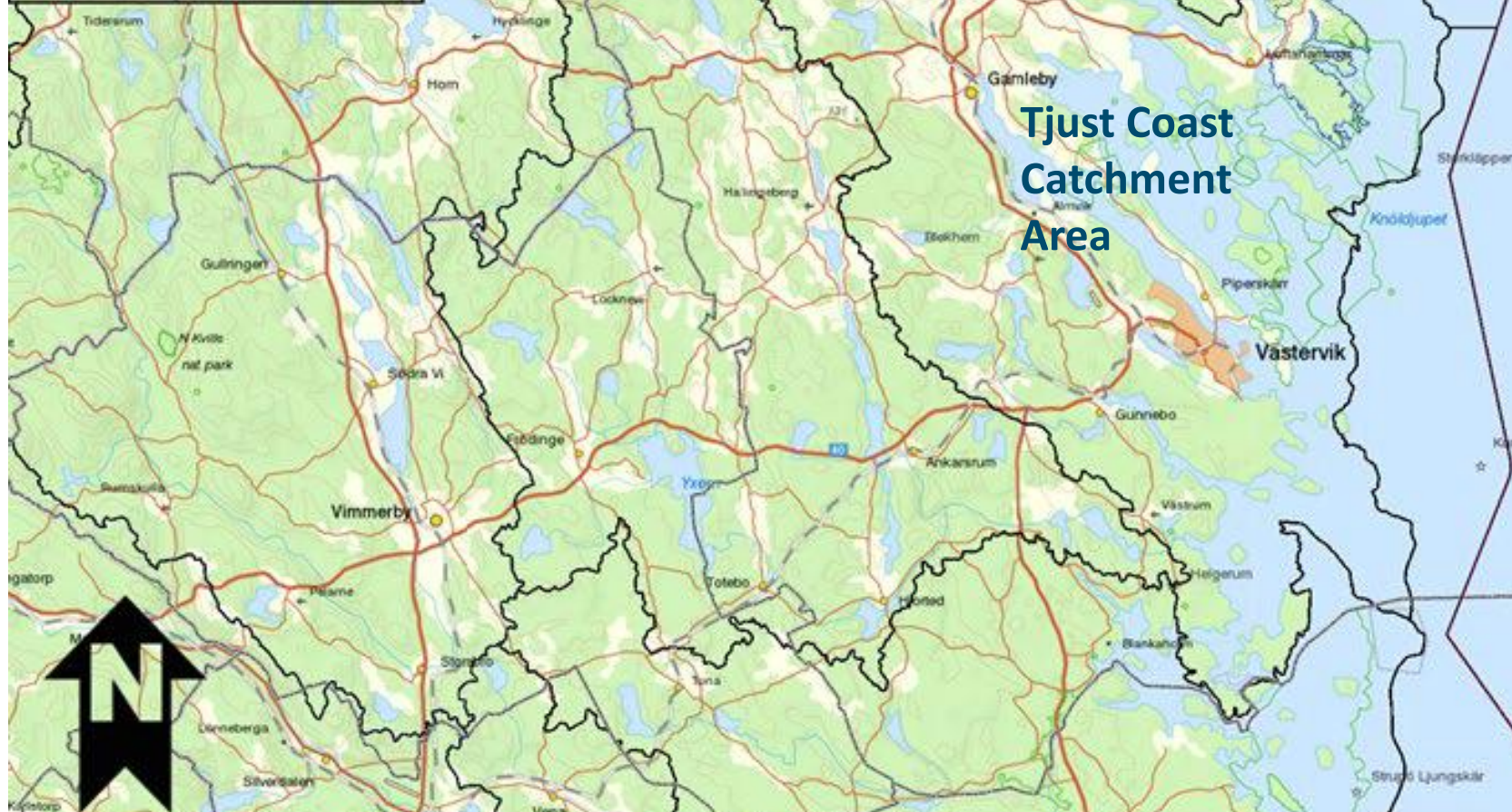


# Case Area

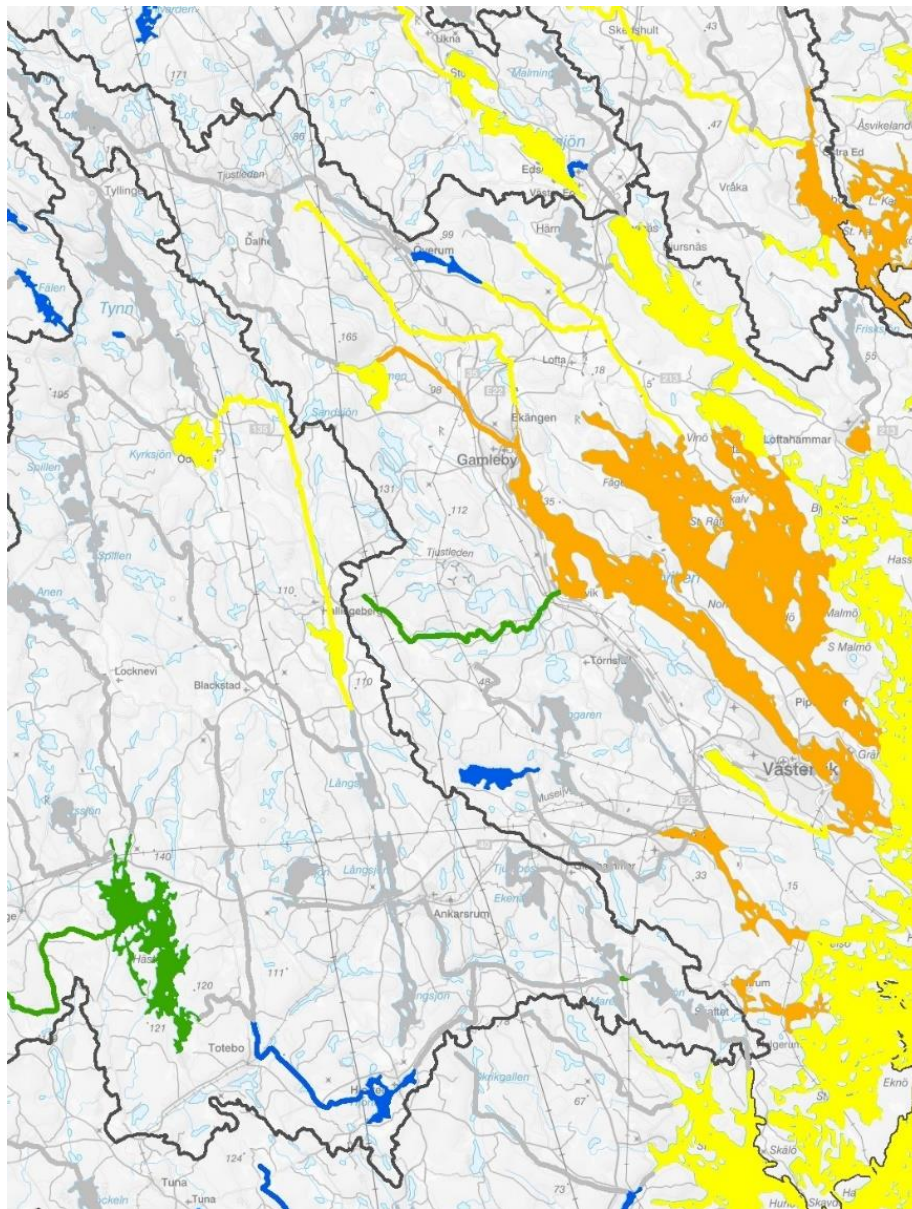
750 km<sup>2</sup>

70% forest,  
15% agricultural land,  
10% lakes,  
5% built

## Tjust Coast Catchment Area

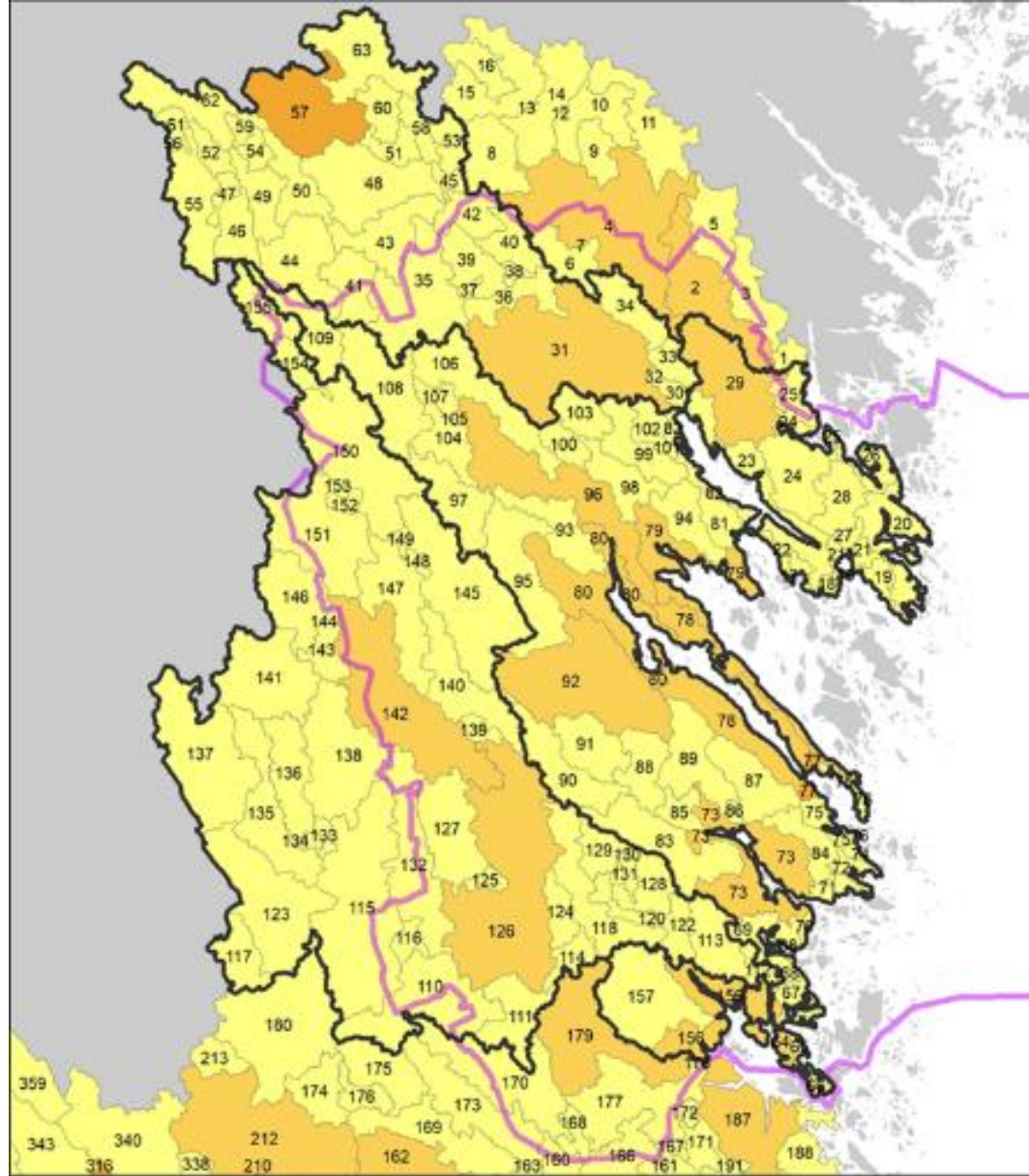






# Case Area VISS Status Classification 2016 Nutrients





## 1. Modelling/GIS

- Nutrient load nitrogen and phosphorus
- Nutrient sources

## 2. Monitoring

## 3. Priority - need for actions





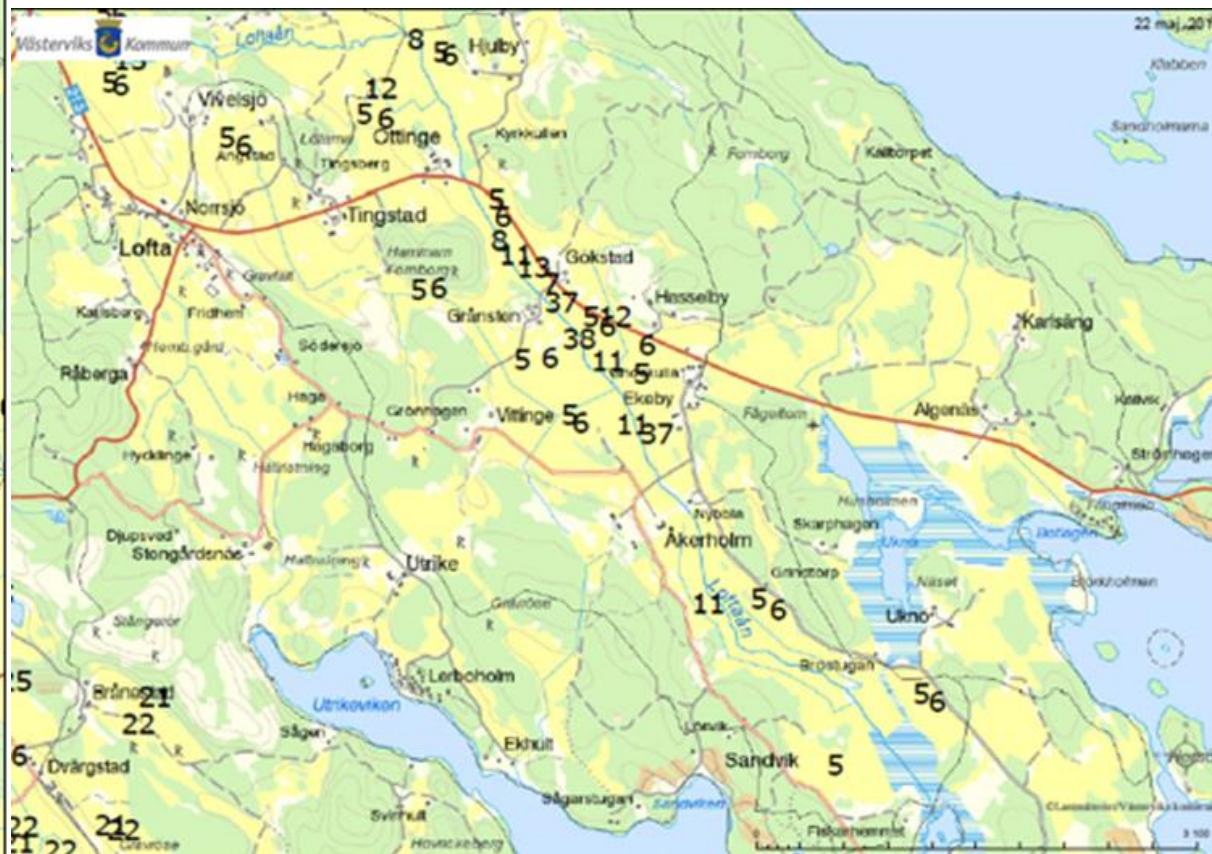
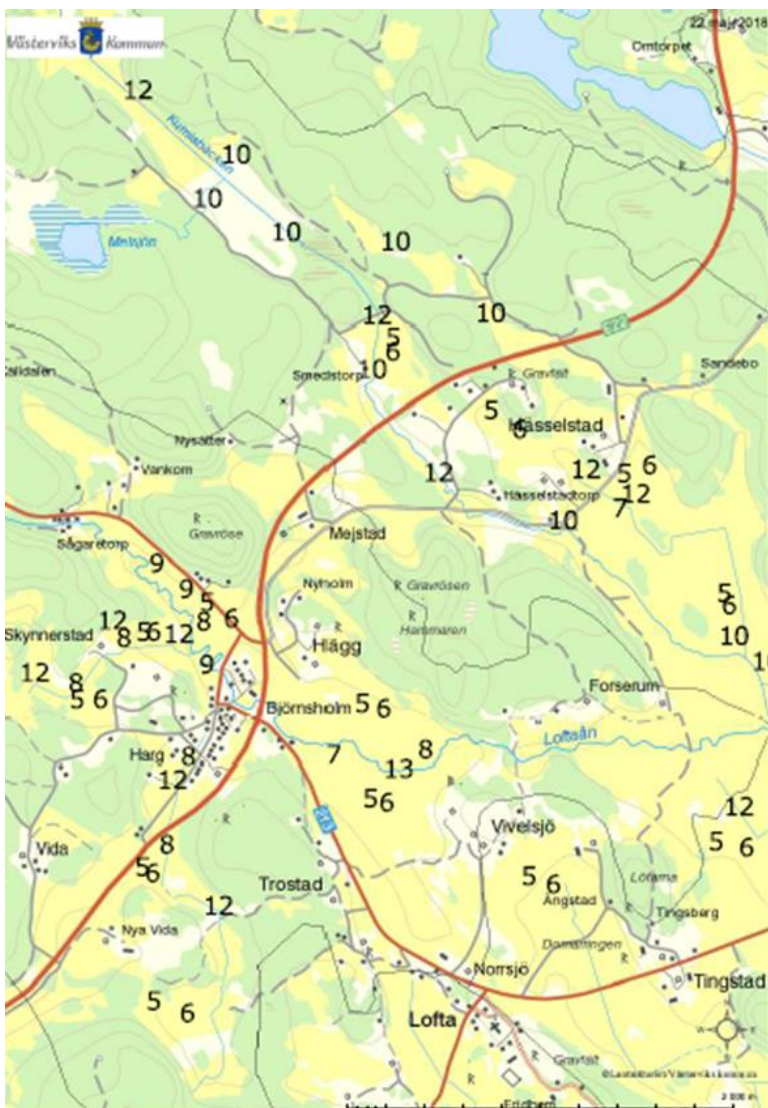
Investment and Implementation plans

**Catchment area perspective**

**Local plans**

**Focus on Agriculture - Measures and development**

## Local investment plan



## Waterdrive

# Cost measures in catchment area 2018 - 2020

Measure	Areal	P decrease kg/year	Year	Costs Euro
Structure liming	500 ha	100	2018-2020	400 000
Small wetlands	12 ha	120	2019-2020	240 000
P-ponds	1 ha	70	2020	30 000
Soil mapping	850 ha	128	2019-2020	17 000
Bevelling ditches	1500 m	25	2020	37 500
Two stage ditches	1500 m	390	2020	75 000
Filter ditches	30 ha	30	2020	150 000

+ Project Management    100 000 Euro

**Total sum: 1 million Euro**





## Implemented and planned measures



# Calculation of costs of environmental measures – reality

Soil mapping	20	Euro/ha
Structure liming	800	Euro/ha
Wetlands	20 000	Euro/ha
Phosphorus pond	30 000	Euro/ha
Ecological functional zones	45	Euro/m
Lime/biochar filtration ditches	5000	Euro/ha
Woodchips filtration ditches	3000	Euro/ha
Two step ditches	50	Euro/m
Bevelling ditches	25	Euro/m
Protection zones	500	Euro/ha
Adapted groundwater surface	1500	Euro/ha

## Cooperation structures - **Catchment officer in the municipality**

- Close contact with farmers
- Close contact with local authorities
- Advice
- Financing – LONA, LOVA, Leader, etc.
- Contact with other authorities and academia
- Monitoring
- Planning, design
- Reporting, information



# From investment plan to implementing measures

- Initial dialog – Catchment area
- Local plan in collaboration with landowners/SWOT
- Financing - including landowners
- Agreement
- Procurement
- Implementation
- Final inspection
- Monitoring



# Denmark



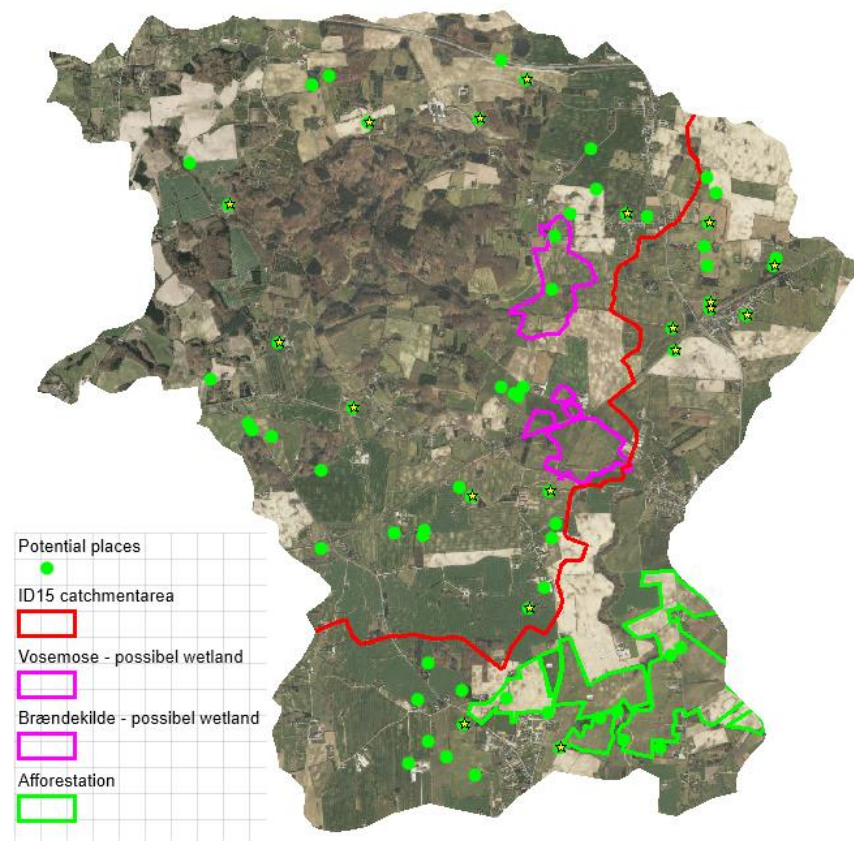
**Environmental measures  
with N & P effect in 2 ID 15  
catchments at Funen –  
focus on the economy**



# Disposition

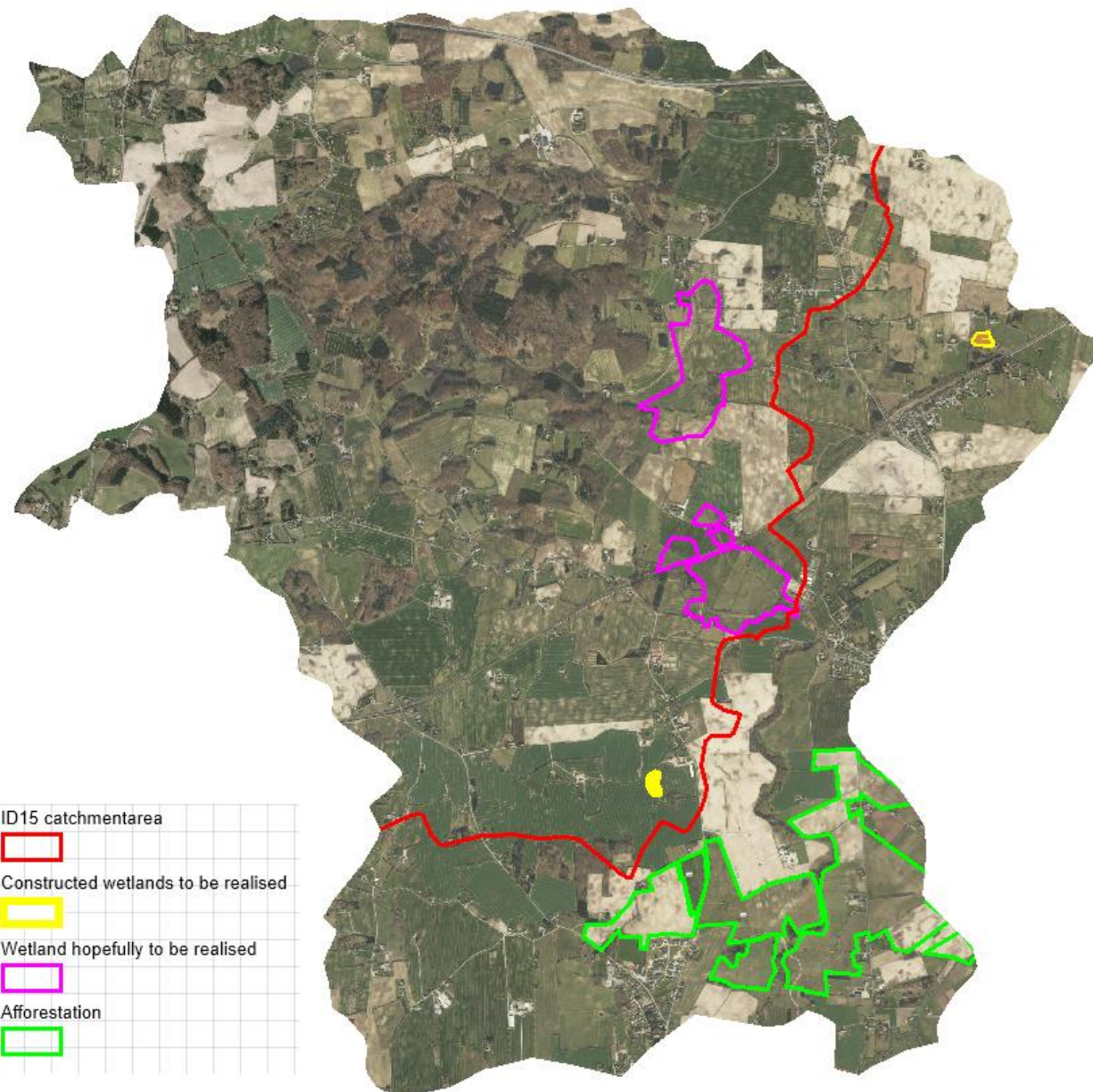
- 1. The project**
- 2. How to estimate the total costs in the two ID15-catchmentareas**
  - A. Constructed wetlands**
  - B. Wetlands**
  - C. Afforestation**
- 3. Summing up**

# The project area





# Projects being realised



ID15 catchmentarea
Constructed wetlands to be realised
Wetland hopefully to be realised
Afforestation

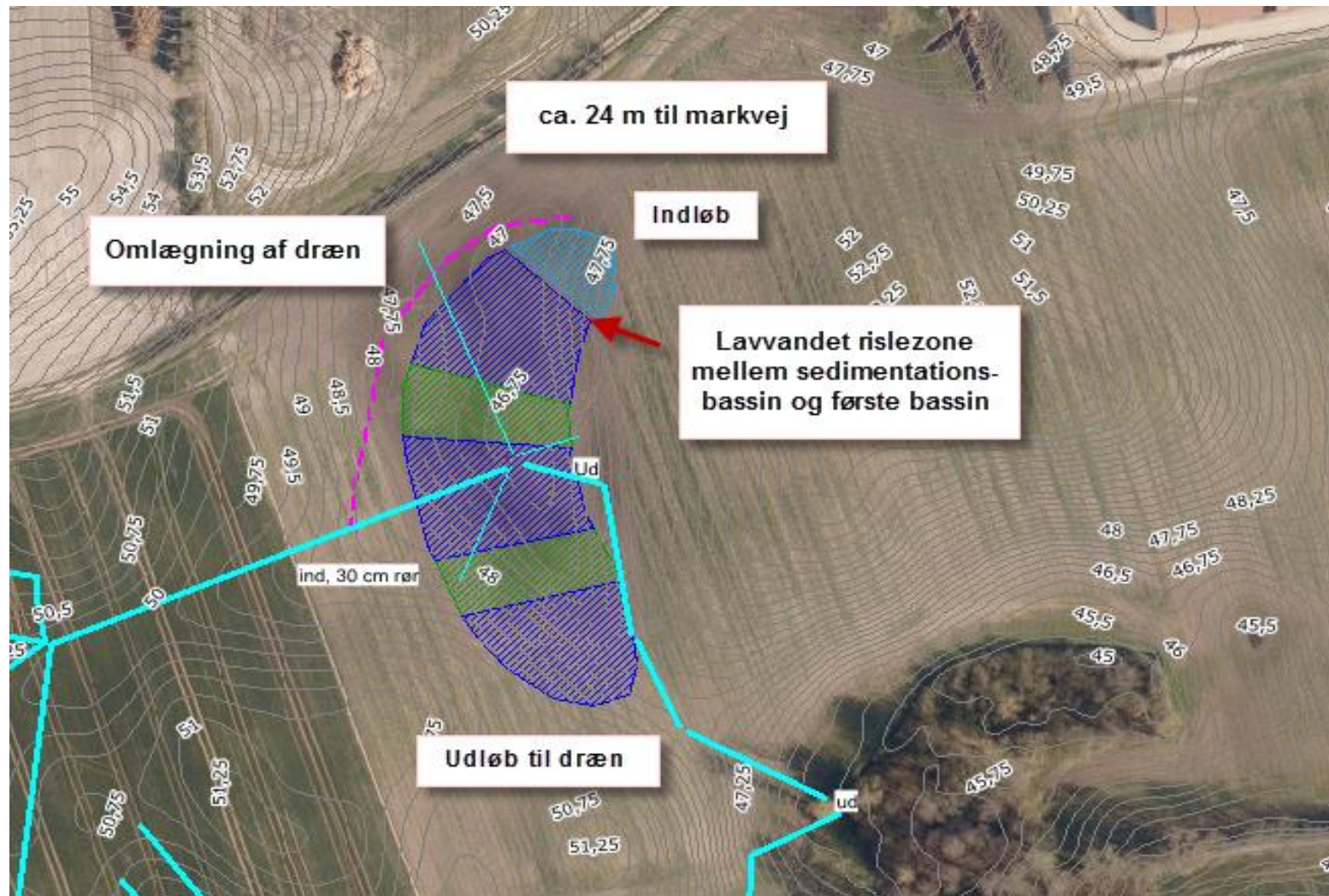


# Projects being realised





# Projects being realised



# Objective causes that stop projects

- Too little farmed land in rotation in the drainage area – the requirement is 80 % of the drainage area in order to be able to apply for grants.
- The place where the farmer wants to make a measure is not suitable as defined by the state, so he won't be allowed to make a measure on that spot.
- Lack of liquidity. Although the landowners/farmers receive 50 % of the grant before they have had the expenses not everybody has the liquidity to spend money on the costs of establishing the constructed wetland.
- The drains lie too deep, so a pump is necessary.  
Many farmers are not so keen to use a pump unless they obtain better drained fields at the same time. They don't want to have to pay the operating costs of the pump for the next 10 years, if it is only for the sake of the constructed wetland.
- The drain is not a drain, but a piped stream which means, that some municipalities will not allow us to lead the water through a constructed wetland.

We intend to have a focusmeeting about the farmers view on the measures 3/11.



## A straight stream, deepened – seem artificial





## Pump needed



## Figuring out costs of constructed wetlands – theoretical places

A precondition for figuring out the costs of constructed wetlands is:

The farmers will not pay more for the constructed wetland, than they receive from the State as subsidy for the project.

The subsidies can be seen on the next powerpoint



# The subsidies for constructed wetlands, 2020

	Basic grants (Euro), 1 € = 7,45 kr.	Price per sqm. water, (€)
Mandatory parts	20.000	5,10
Establishment of a pump	9.262	1,21
Planting plants	369	0,13
Making a path	1.074	-
Expences for construction consultancy	1.779	-
Authority permits	832	-
Archaeological preliminary investigations	1.584	0,34

# Exampel of calculation – location number 83.729

## Calculation:

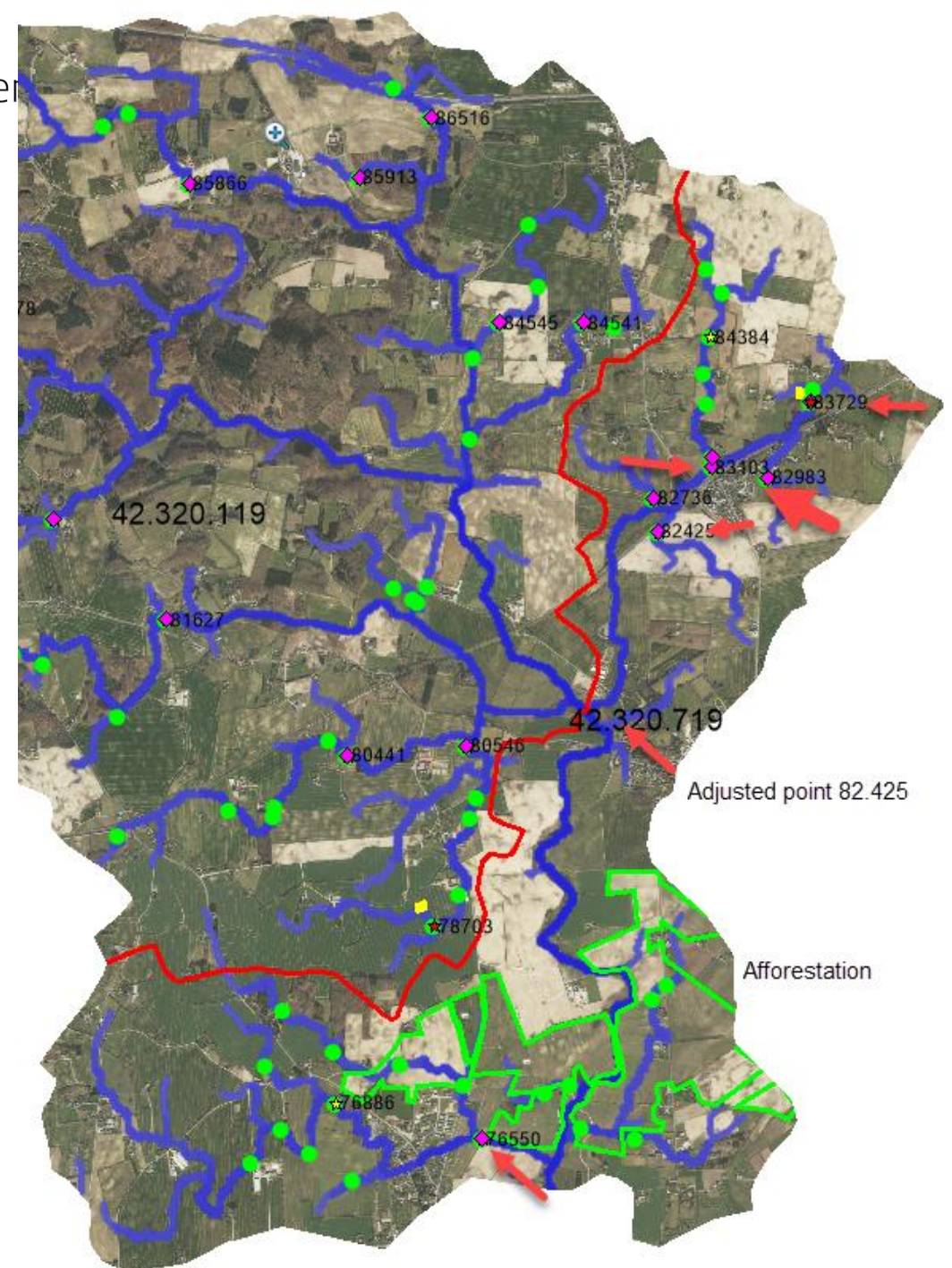
Area of the constructed wetland: 5.500 sqm

Price mandatory parts (digging) + pump + planting in low-watered bassins + advisory assistance while digging + archaeological feasibility studies

$$(20.000 + 5.500 \cdot 5,1) + (9.262 + 5.500 \cdot 1,21) + (369 + 5.500 \cdot 0,13) + 1779 + (1584 + 5.500 \cdot 0,34) = 70.275 \text{ Euro}$$

# Possible constructed wetlands – theoretically – and area of afforestation in ID15 42.320.719

→ : Points at the potential places, where  
the cost is calculated  
The other spots are irrelevant  
in this connection.





# Estimated costs in on of the catchmentareas – 42.320.719

Location number	Catchment In hectare	Constr. wetl, area - sqm	N-effect, kg N/year	Total cost of the measure in Euro (1 Euro=7,45 dk)
83.729	55	5.500	284	70.275
82.983	21	2.100	123	47.228
83.103	92	9.200	481	95.356
82.736	42	4.200	201	61.463
82425, adjusted	87	8.700	366	91.966
76550, adjusted	247	24.700	1.023	200.423
<b>Total</b>	<b>544</b>	<b>54.400</b>	<b>2.478</b>	<b>566.711</b>

The total projectareas is estimated to 1,75 % of the catchments, which is 9,5 hectares or 60.000 € as a one-time compensation

# ID15 nr. 42.320.119 – constructed wetlands - projects to be realised

Location number	Catchment	Constr. Wetl, area - sqm	N-effect	Total cost of the measure in Euro (1 Euro=7,45 dk)
	In hectare			
84.451	53	5.300	194	67.839
79.069	43	4.300	253	46.738
<b>Total</b>	<b>96</b>	<b>9.600</b>	<b>447</b>	<b>114.577</b>



## Wetlands





# Expences for wetland

Largest part of the expences to wetlands is constituted by compensation to the farmers.

Wetland	Expected costs, €	Calc. N-effect	€/kg N
Brændekilde, 30 hectares	1.113.318	2.100	530
Vosemose, 33 hectares	791.427	2.677	296

# Expences for afforestation

Area: app. 145 ha

Price is not known.

The costs to afforestation may based on a project in Svendborg be calculated to 3.816.292 € (around 26.300 € /hectare) (<https://naturstyrelsen.dk/nyheder/2020/september/ny-stor-skov-paa-vej-til-fynboerne/>)

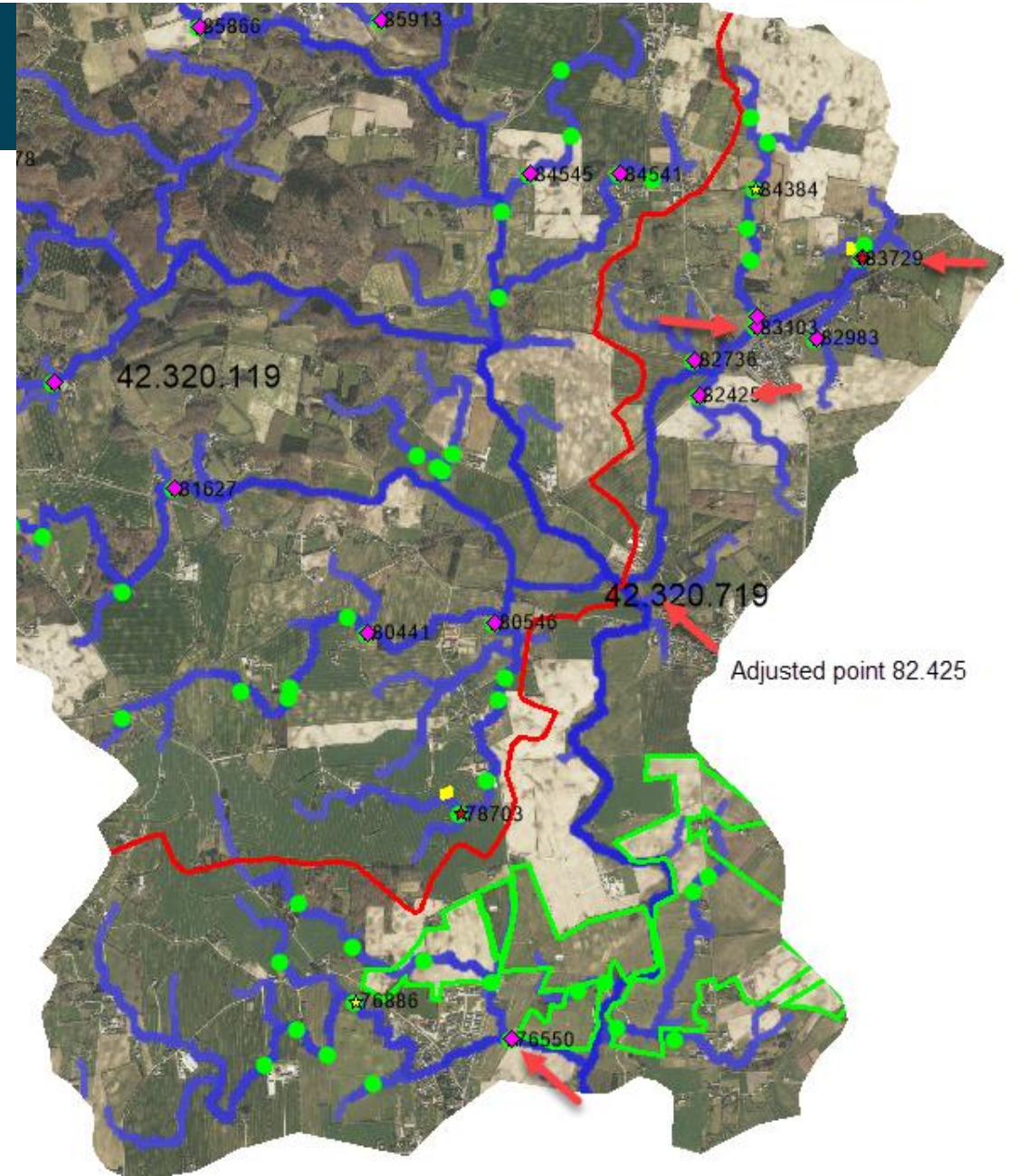
The costs is regulated to a lower level based on the expected land price in the two areas.

# Catchmentarea 42.320.719

Theoretically 6 constructed wetlands.

Green fields: 145 ha afforestation is being realized.

Being realized in cooperation between Odense and Assens municipalities, Hedeselskabet and Vandcenter Syd (distribute water in Odense and are responsible for handling sewage in Odense and the municipality of Nordfyn)





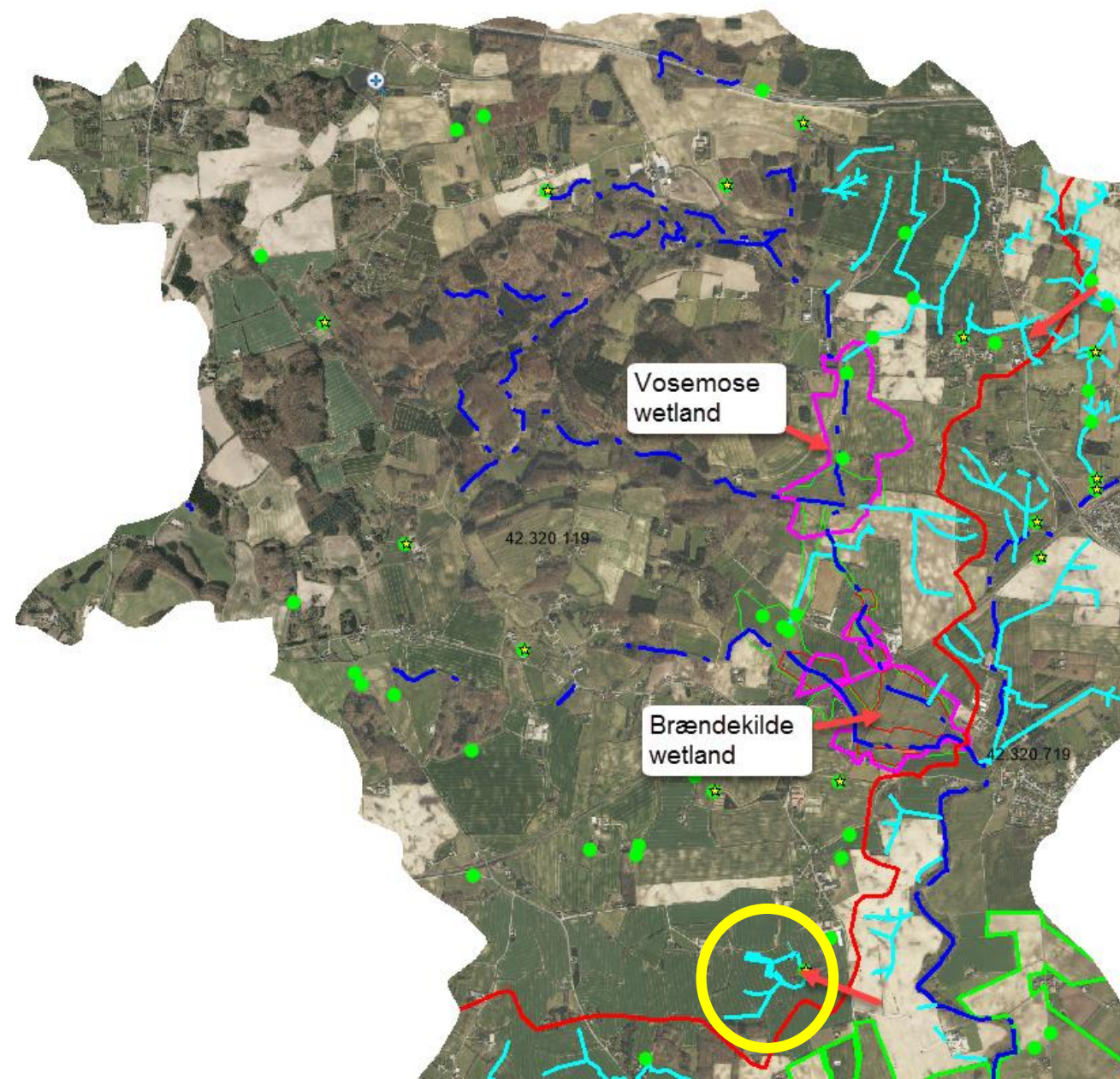
# Estimated costs in one of the catchmentareas – 42.320.719

Environmental measure	Costs, €	N-effect, kg N/year	Costs per kg N, €
Constructed wetland, theoretically	626.700	2.478	253
Afforestation	3.816.300	6.424	594
<b>Total</b>	<b>4.443.000</b>	<b>8.902</b>	<b>500</b>

# Catchmentarea 42.320.119

Municipality of Odense is working on realizing two wetlands

1 constructed wetland is expected to be realized next year



# Estimated costs in on of the catchmentareas – 42.320.119

Environmental measure	Costs, €	N-effect, kg N/year	Costs per kg N, €
Constructed wetland to be realised	47.000	253	230
Wetlands, Brændekilde	1.113.000	2.100	530
Wetland, Vosemose	791.000	2.677	296
<b>Total</b>	<b>1.962.000</b>	<b>5.030</b>	<b>390</b>



An aerial photograph of a water treatment facility situated in a green, hilly landscape. The facility consists of several rectangular and circular basins. The water in the basins is murky brown, indicating a filtration or sedimentation process. A dirt road runs alongside the basins, and there are some trees and shrubs in the background.

# Questions????????



# Finland

Mikko Ortamala  
21.10.2020

## River Loviisanjoki Renovation







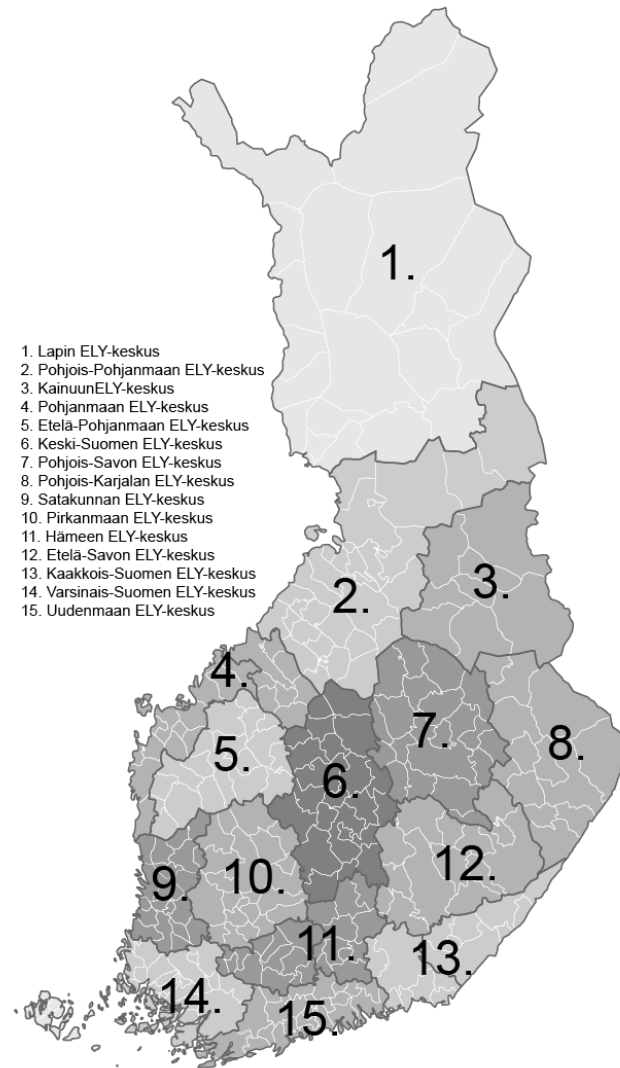
# Renovation processes in Finland

- Holistic Water management

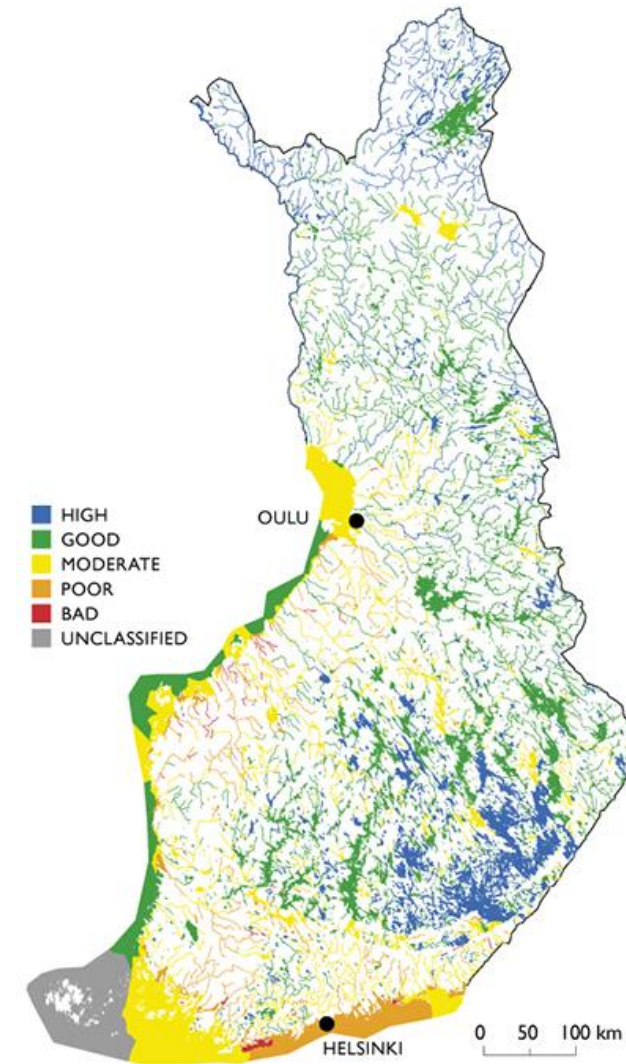
## Drainage corporate bodies



Drainage corporate bodies are organizations which consist of those land owners that get benefit or profit from the drainage. Drainage corporate bodies have been established since 1883 to maintain the ditches.



Elinkeino, liikenne ja ympäristökeskus

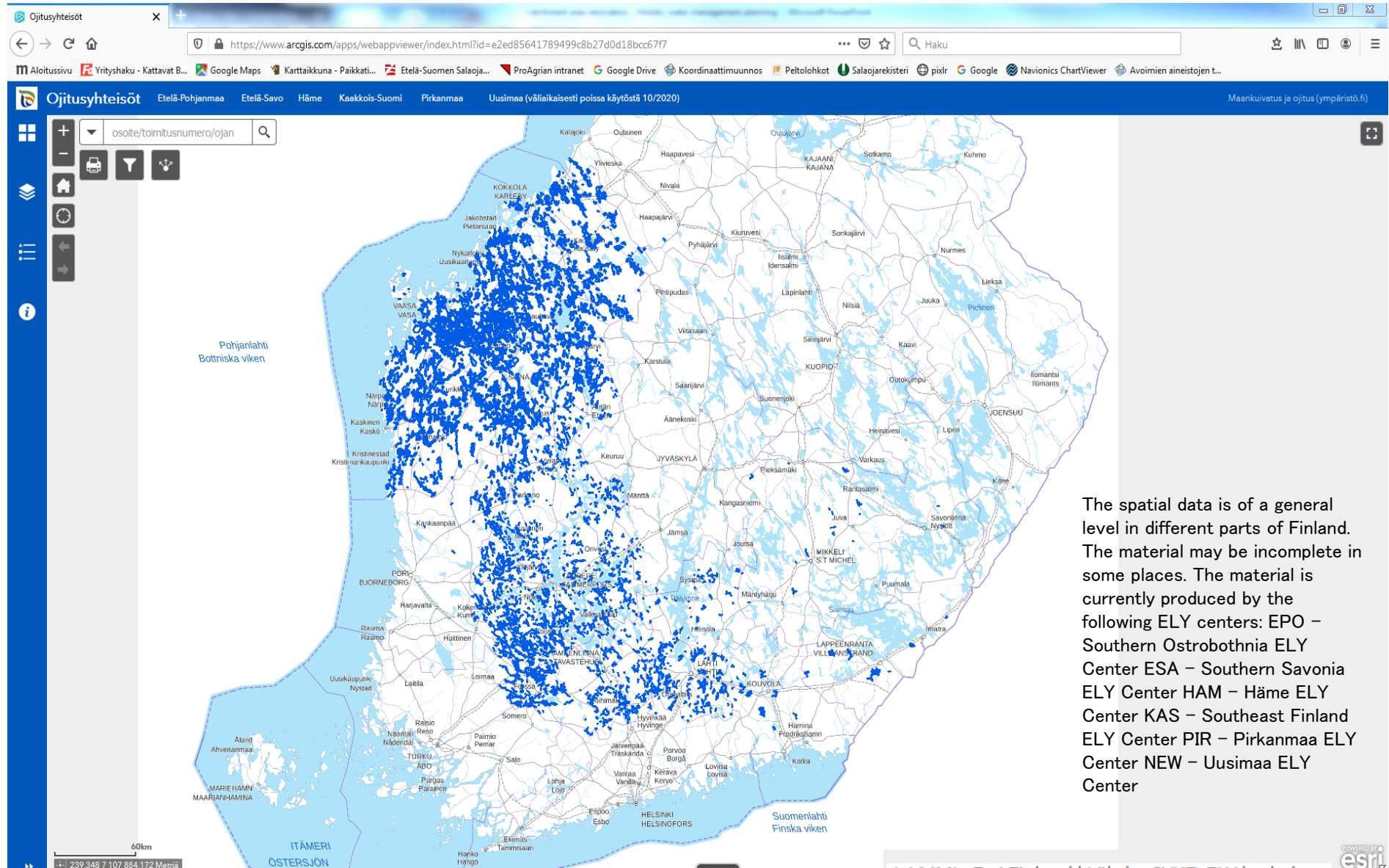


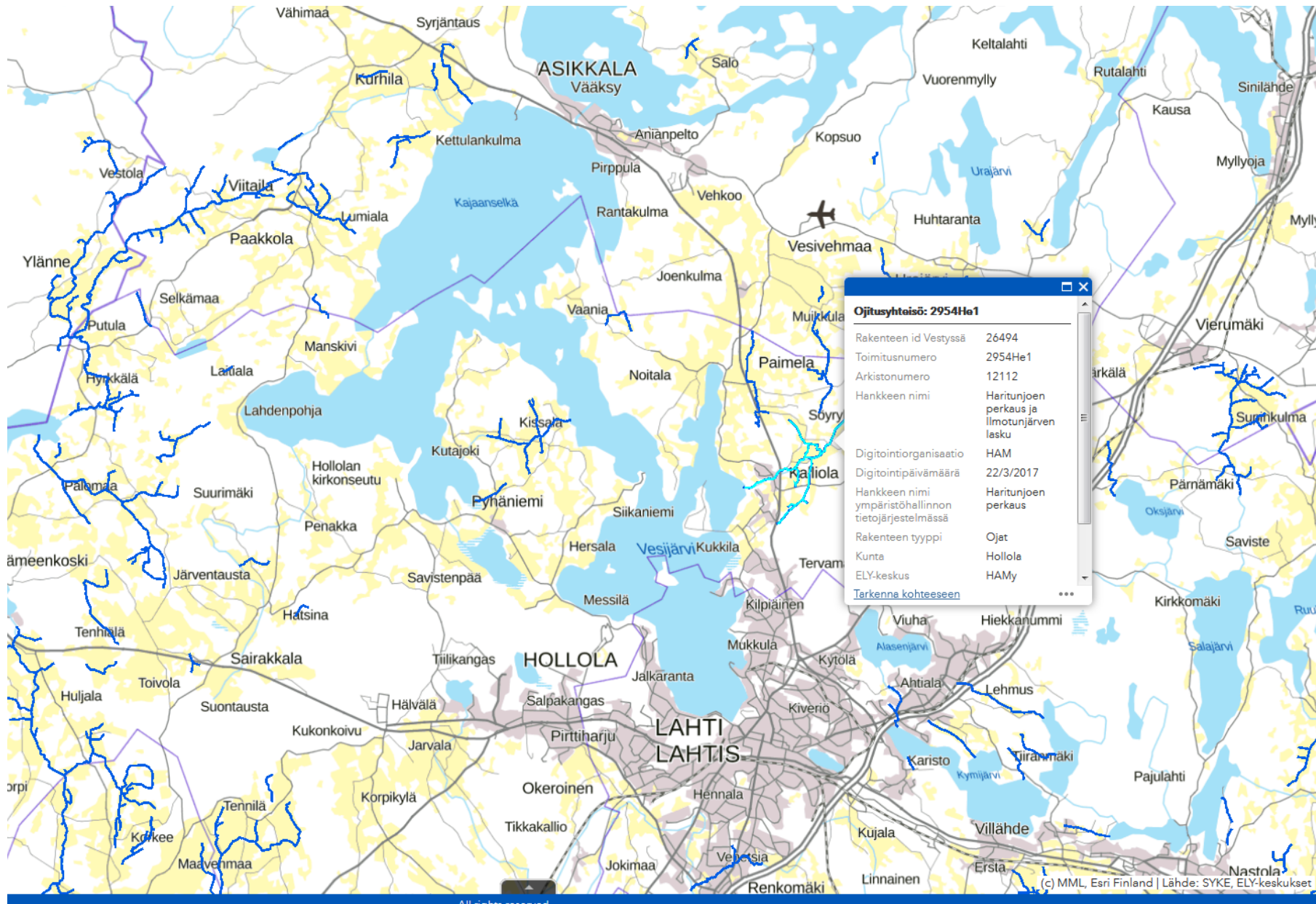
Suomen ympäristökeskus, SYKE

The number of drainage corporate bodies and drainage areas is not accurate, but it is estimated to be tens of thousands. Each year 70 to 100 projects will be funded for basic drainage in Finland. The need for maintenance for basic drainage can be remarkable.



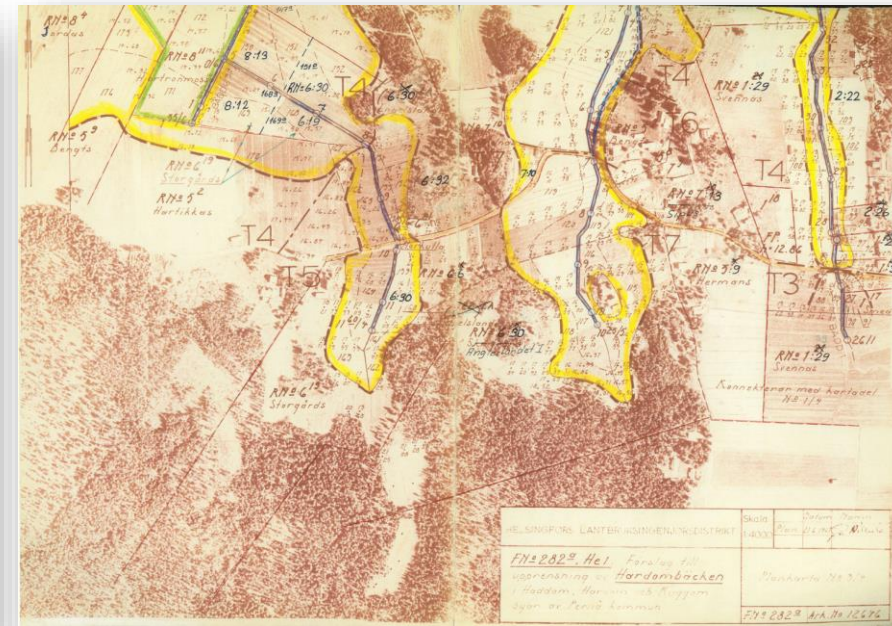
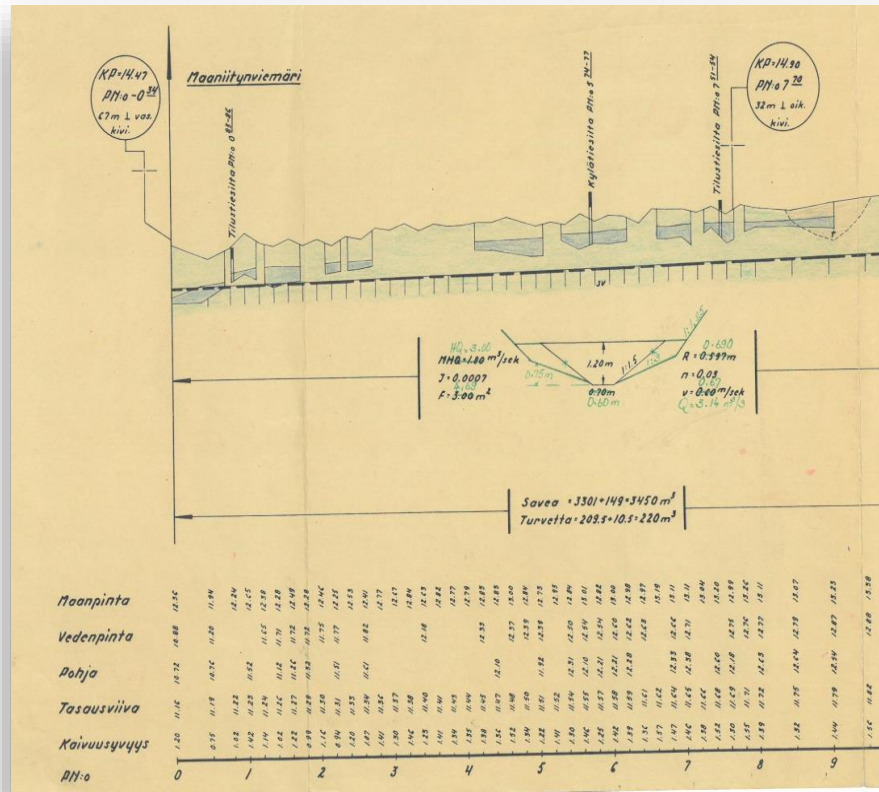
# Drainage corporate bodies / spatial data



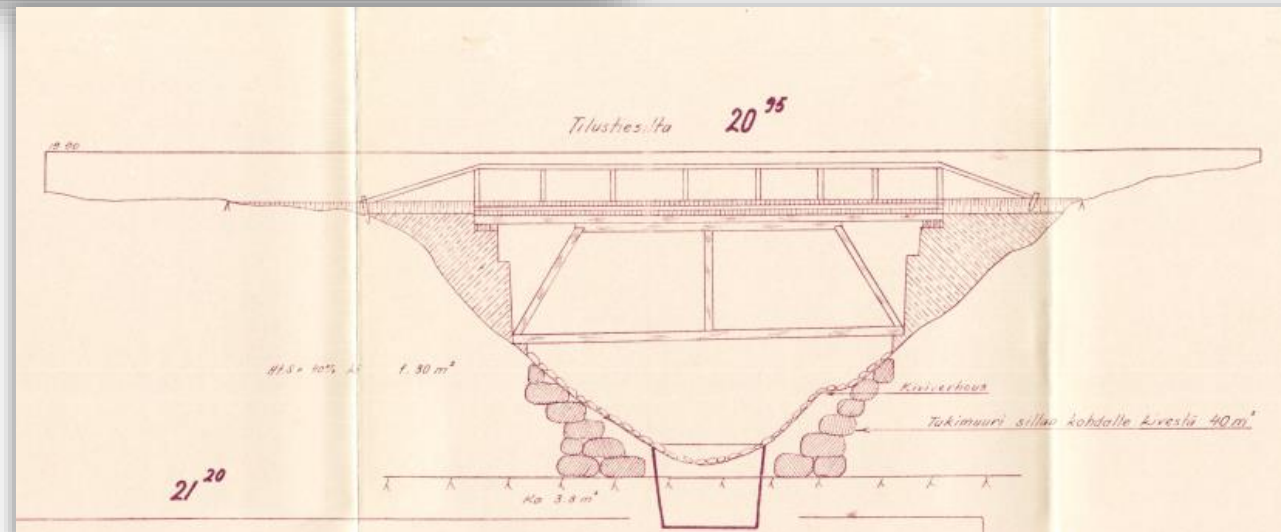




# Old plannings

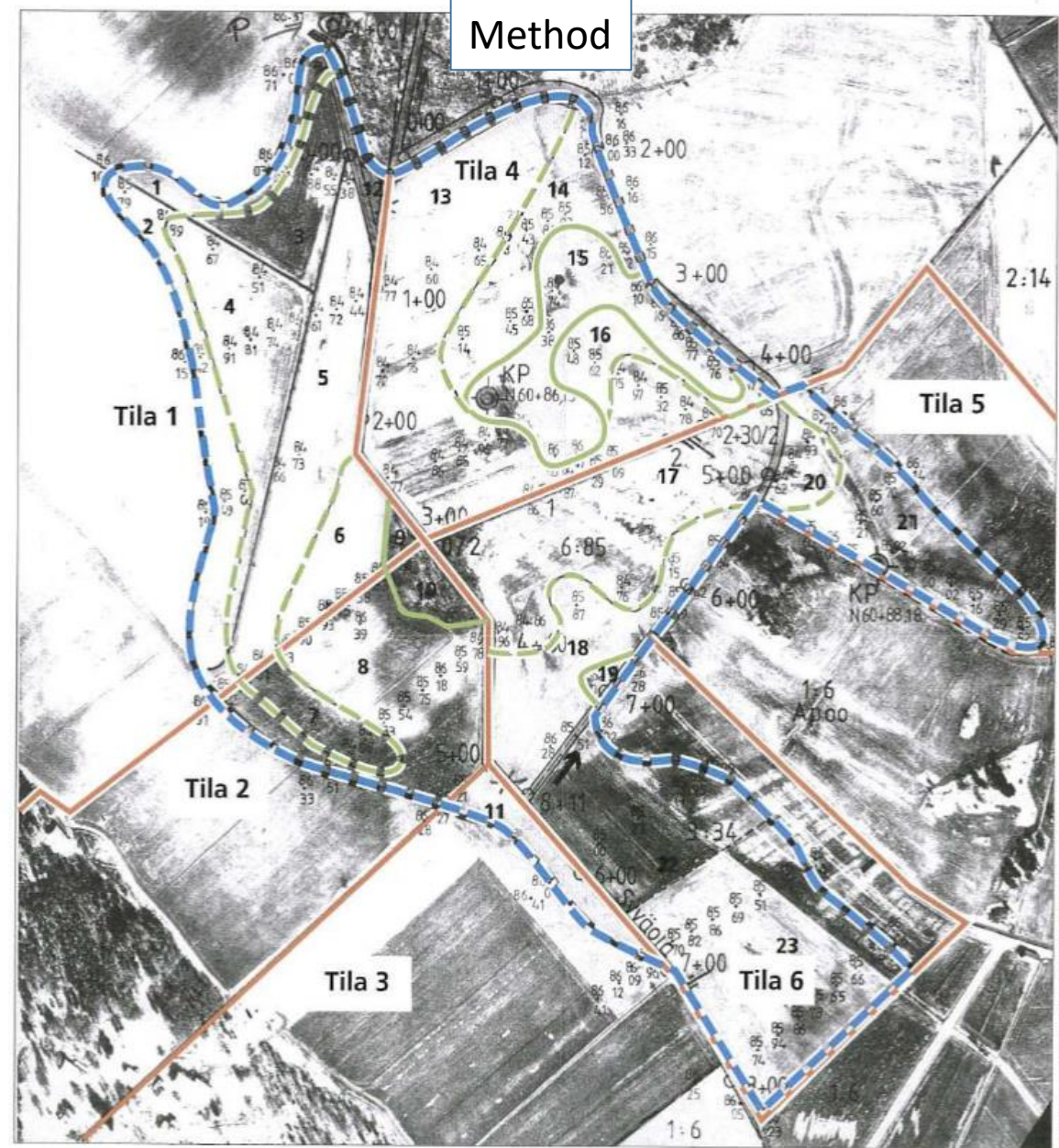


Tn. 2954He1 = project number





Plot =  
Land use and  
Altitude!!!



Land value coefficient and  
altitude coefficient from  
old plans

[illegible]



# Case River Loviisanjoki



# Case River Loviisanjoki



Loviisan sanomat, Arto  
Henriksson

15,3 km

Uoman paalulukku	Valuma-alueen pinta-ala km2	Virtaamat	
		HQ 1/20 m3/s	NQ m3/s
17+00/ 1	113,76	16,52	0,75
22+00/ 1	113,33	16,21	0,74
29+42/ 1	112,90	16,14	0,73
32+68/ 1	111,88	15,75	0,72
40+35/ 1	102,40	13,74	0,62
46+00/ 1	101,79	13,66	0,62
52+66/ 2	101,19	13,58	0,62
55+65/ 2	98,57	13,01	0,59
60+20/ 2	86,40	10,64	0,48
63+60/ 2	84,49	10,22	0,46
69+70/ 2	83,80	9,96	0,45
70+96/ 2	82,99	9,68	0,44
78+46/ 3	81,94	9,55	0,43
84+90/ 3	80,87	9,43	0,43
89+16/ 3	79,80	9,13	0,41
94+60/ 3	78,93	9,03	0,41
95+76/ 3	77,85	8,91	0,40
102+00/ 3	77,30	8,84	0,40
106+91/ 3	77,09	8,65	0,39
107+75/ 3	75,91	8,52	0,39
124+80/ 3	74,69	8,38	0,38
128+00/ 3	74,29	8,17	0,37
130+20/ 3	73,69	8,11	0,37
140+00/ 3	72,72	8,00	0,36
152+00/ 3	66,03	6,97	0,32
165+40/ 3	63,68	6,30	0,29
176+00/ 3	58,85	5,18	0,24



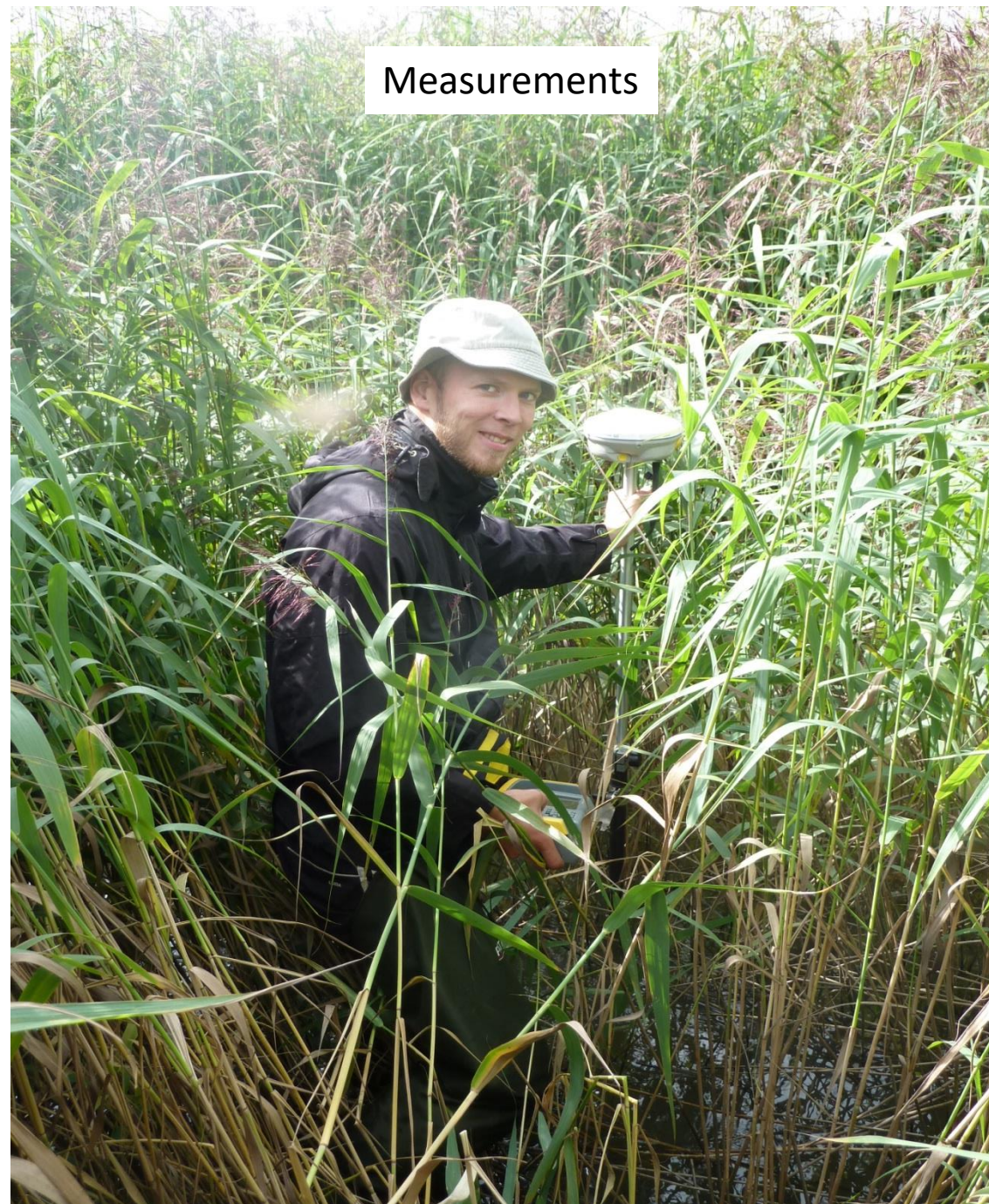


2020



### Examinations:

- Difference between water level and field surface
- The discharges
- Wells
- Ditches
- Drums
- Difference between drainage pipes and field surface
- Distance between drainage pipes
- Gradients
- Need for maintenance (flushing)
- Possibilities for water protection structures
- Habitat restorations



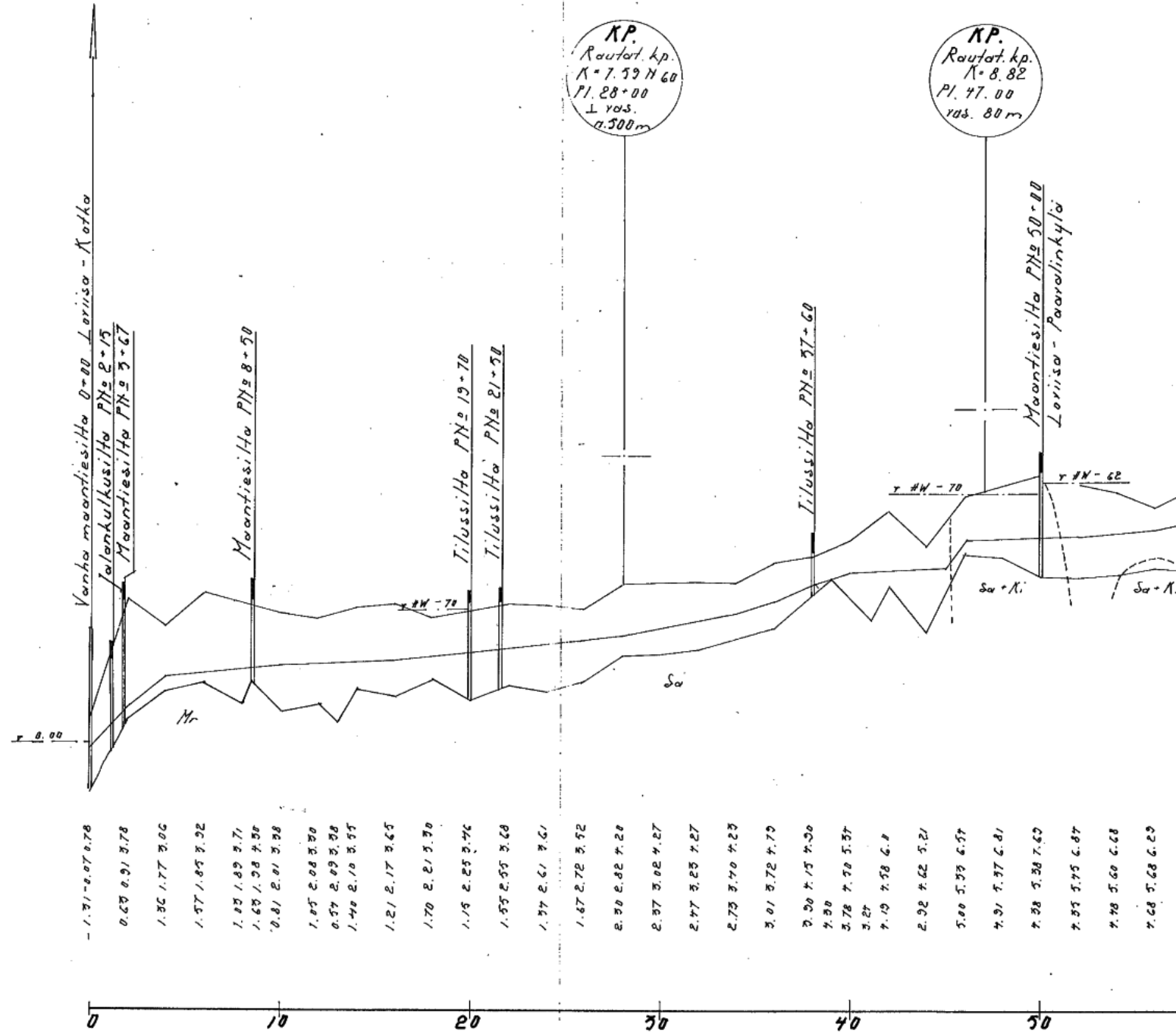
Measurements





Maanpinta  
Vedenpinta  
Pohja

PH<sub>2</sub>



K.P.  
Rautat. kp.  
K = 7.59 H 60  
Pl. 28+00  
± vas.  
0.500m

K.P.  
Rautat. kp.  
K = 8.82  
Pl. 47.00  
vas. 80m



# Permission, regulations, monitoring

- Monitoring plan (water quality and ecology, fisheries)
- Monitoring of ecological status, fisheries, benthos and crayfishes
- Valuable rapids
- Soil drills (groundwater) pl 1700-3300
- Habitat restorations (trout, crayfish) pl 4600-4690
- Valuable landscape areas and biotopes
- Wells and other water management structures (drinking and waste water)
- Bridges and other infrastructure
- Acid sulphate soils (test holes every 100m) pl 13600-15200
- Trees, shrubs (shady vegetation)
- Valuable forest habitats
- Excavation on the driest time
- Floodplains and two-stage channels
- Slopes 1:2
- Low-flow channel (fishery)(to all renovation area)



## SISÄLLYSLUETTELO

1	YLEISTÄ	1
2	HANKKEEN SIAINTI JA ALUEEN YLEISKUVAUS	1
3	LOVIISANJOEN PERKAUS- JA KUNNOSTUSHISTORIA	2
4	UOMAN NYKYTILA JA KUNNOSTUSTARVE	3
5	HANKE-ALUEELLA SIAITSEVAT JOHDOT JA KAAPELIT	4
6	PARANNUSTOIMENPITEIDEN TAVOITTEET	4
7	KÄYTÄNNÖN KUNNOSTUSTOIMENPITEET	4
7.1	Raivaukset ja muut alustavat työt	5
7.2	Uomakunnostukseen liittyvät yleiset työohjeet	6
7.3	Uomaosuuksittain kohdenneet työohjeet	7
7.3.1	Myllykoski K3, plv. 7675 – 7840	7
7.3.2	Myllykoski K3, plv. 7600 – 7675	8
7.3.3	Myllykoski K3, plv. 7330 – 7600	9
7.3.4	Kuivatuskuntien K1/K2 välinen uomaosuu, plv. 4530 – 4620	9
7.3.5	Tulva-alueiden käsittely	10
7.3.6	2-tasouomarakenteet	11
7.3.7	Uoman oikaisu	12
7.4	Pohjapadot ja uoman vedenkorkeuden hallinta	13
7.5	Rumpu- ja siltarakenteet	14
8	HANKKEEN VAIKUTUSTEN ARVIOINTI	14
8.1	Vaikutukset suojelualueisiin ja suojeltaviin lajeihin	14
8.2	Kalataloudelliset vaikutukset	14
8.3	Vesistövaikutukset	16
8.4	Maisemavaikutukset	16
9	HYÖTYALUE JA OSITTELU	17
10	VALUMA-ALUEET JA VIRTAAAMAT	17
11	RUMMUT	17
12	UOMIEN JA RAKENNELMIEN KUNNOSSAPITO	19
13	OSAKKAAN OSALLISTUMISVELVOLLISUUS	19
14	VASTUUKYSYMYKSET	19
15	MAANPARANNUS JA KANNATTAVUUS	19
16	SUUNNITTELIJAN YHTEYSTIEDOT	22
17	SIAINTIKARTTA	23
18	OTE PERUSKARTASTA	24
19	LÄHDELUETTELO	25

## LIITTEET

kuivatuskunta K2–K3 kokonaiskustannusarviot  
kustannusosittelut

## Piirustukset:

- 1.– 4. suunnitelmakartat, MK 1:4000  
5.– 8. uoman pituusleikkaukset, MK 1:4000 / 1:200  
9.– 13. uoman poikkileikkaukset, MK 1:100 / 1:100

## Contents

1.	COMMON
2.	LOCATION OF THE PROJECT AND OVERVIEW OF THE AREA
3.	HISTORY OF RIVER LOVIISANJOKI RENOVATION
4.	CURRENT STATUS OF THE RIVER AND THE NEED FOR REPAIR
5.	WIRES AND CABLES LOCATED IN THE PROJECT AREA
6.	AIMS OF THE MEASURES
7.	<b>PRACTICAL RENOVATION MEASURES</b>
-	<b>Work instructions targeted by sections, 2-stage ditch structures, fishery / flood stream structures</b>
8.	<b>PROJECT IMPACT ESTIMATIONS</b>
-	<b>Impacts on protected areas and protected species, Impact on fisheries, Impacts on the water body</b>
9.	BENEFIT AREA AND COSTS SHARING
10.	CATCHMENT AREAS AND FLOWS
11.	DRUMS
12.	MAINTENANCE
13.	OBLIGATIONS OF SHAREHOLDERS
14.	LIABILITY ISSUES
15.	PROFITABILITY
16.	DESIGNERS CONTACT INFORMATION
17.	LOCATION MAP
18.	LARGE-SCALE TOPOGRAPHICAL MAP
19.	BIBLIOGRAPHY

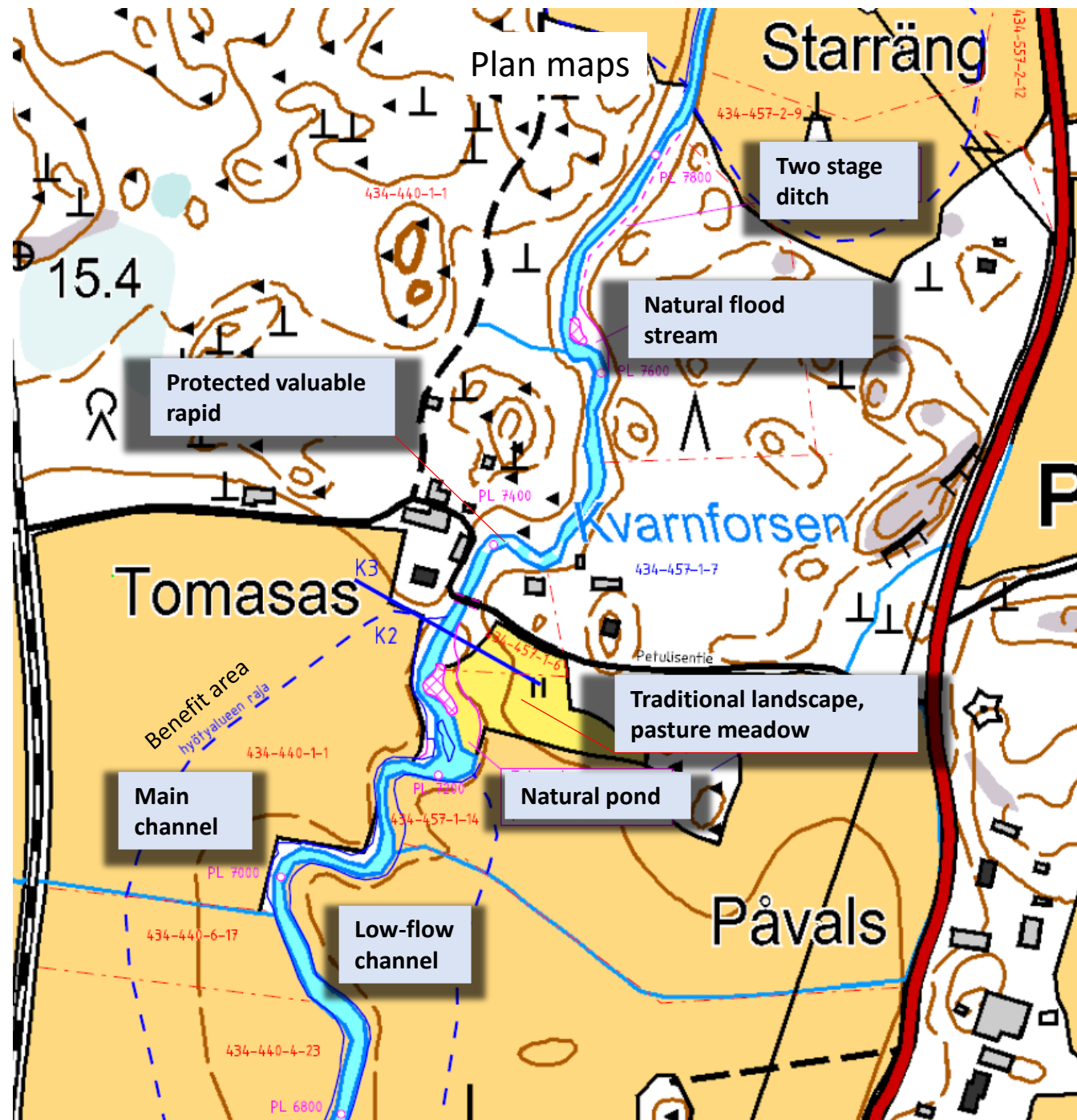
## ANNEXES

Total cost estimates

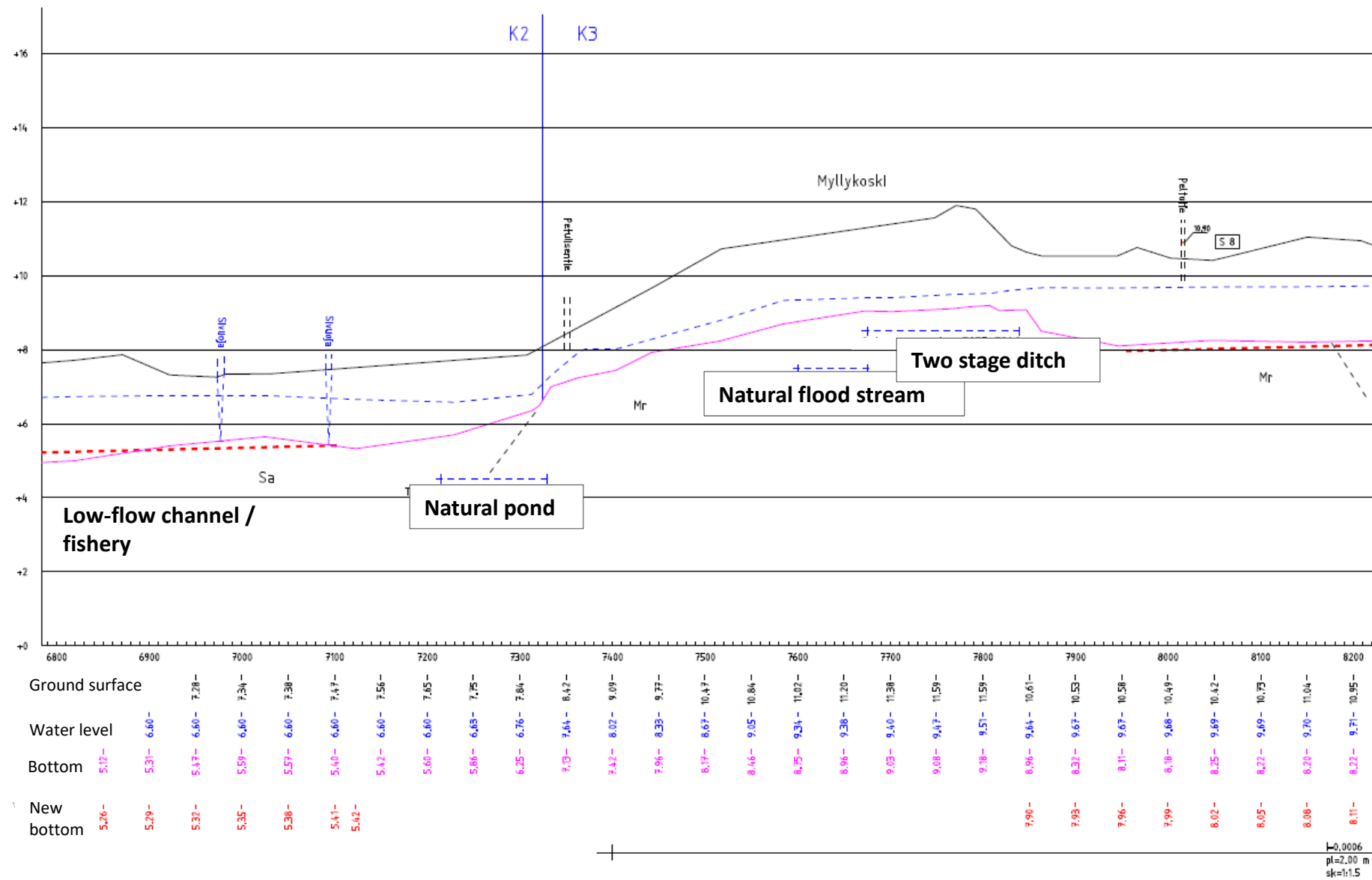
## Drawings:

- 1.– 4. Plan maps, 1: 4000  
5.– 8. Longitudinal sections of the channel, 1: 4000/1: 200  
9.–13. Cross sections of the channel, 1: 100/1: 100



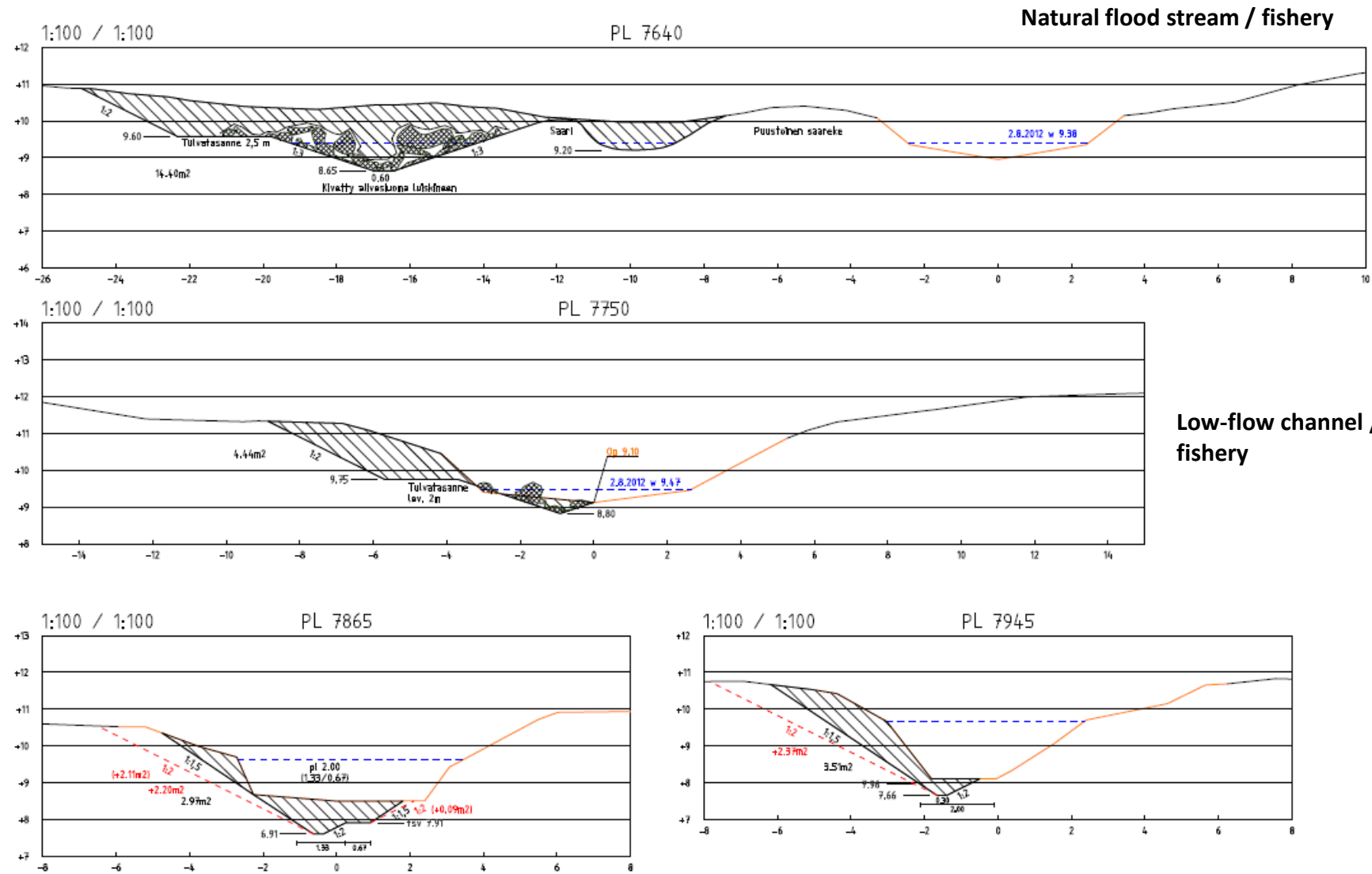


# Slittings





# Cross Sections



Kohde: Loviisanjoki Kuivatuskunta K3 Costs K3  
 Toim.No: 4396 He 1  
 Kunta: Loviisa  
 Laati: Etelä-Suomen Salaojakeskus / Janne Pulkka 1.12.2016 (korjattu 28.11.2018)

	Kustannuslaji		Yksikkö	Määrä	a / €	€	Yht €
1. Preliminary work	1. Alustavat työt						
	Työpaalutus						
	sis. kaksi miestä ja paalutustarvikkeet						
	- Marking measurements	plv. 7600 – 16799	m	9199	0,70	6439	
	Vanhojen louhekkien ja kaivumaiden käsittely						
- Clearing the workspace	tarvittavan työtilan saamiseksi (10–20 m leveydellä)						
	plv. 7675 – 7840	m	165	28,00	4620		
	(yht. 165 m)						
		yht.	9364			11059	
							11059
2. Excavations	2. Kaivutyöt						
	KTR						
	- Main channel	Uoma	plv. 7675 – 16799	m3	21483	4,00	85932
			(yht. 9124 m)				
	- Low-flow Channel	Alivesiuoma	plv. 7600 – 16799	m3	2500	6,50	16250
		(yht. 9199 m)					
- Yard areas	piha-alueet	plv. 13600 – 14600	m3	7100	4,50	31950	
		(yht. 1000 m)					
		yht.	31083	m3		134132	
							134132
2.1 spreading of excavated sediment	2.1. Kaivumaiden levitys						
	IDT						
	- Main channel	Uoma	plv. 7675 – 16799	m3	34373	1,00	34373
			(yht. 9124 m)				
	- Yard areas	piha-alueet	plv. 13600 – 14600	m3	11360	2,50	28400
		(yht. 1000 m)					
- 2-stage ditch	2-tasouoma	plv. 7600 – 7840	m3	2240	3,00	6720	
		(yht. 240 m)					
		yht.	47973	m3		69493	
							69493

3. Other measures to increase biodiversity

- Fishery structures / flood stream
- 2-stage ditch

3. Muut luonnon monimuotoisuutta ja maiseman moni-ilmeisyyttä lisäävät kunnostustoimet

KTR					
Tulva-alueen laajen. pvl. 7600 – 7675	m3	620	5,00	3100	
Uoman kiveäminen pvl. 7600 – 7675 kalataloudellisena kunnostuksena	m	75	28	2100	
Tulva-alueen laajen. pvl. 7675 – 7840	m3	780	4,50	3510	
Uoman kevyt kiveäminen uoman monimuotoisuuden lisäämiseksi	m	165	14,00	2310	
					11020

Sivu 4

4. Bridge renovation

Kustannuslaji	Yksikkö	Määrä	a / €	€	Yht €
4. Smiditagetintien oikaisu					
KTR					
Lisäkaivutyö pvl. 13440 – 13540 (sisältäen massojen siirron vanhan uoman paikalle)	m	700	5,5	3850	
Betonisillan muuttaminen putkisillaksi (kustannus perustuu Destian laatimaan suunnitelmaan ja kustannusarvioon)				133800	
					137650

5. Repair of broken discharges

5. Rikkoutuneiden laskuaukkojen sekä laskuaukkokaivojen korjaus (sisältää materiaalin sekä asennustyön)					
Laskuaukot	erä	1	6000	6000	
Laskuaukkokaivot	erä	1	7000	7000	
					13000

6. Landscaping yard areas

6. Viimeistelytyöt					
Piha-alueilla tehtävien kaivutöiden viimeistely					2000

7. Unforeseen costs

7. Ennalta arvaamattomat kulut					
					2000

Planning, supervision and management 4,38%

Välittömät kustannukset				380 354
Yleiskustannukset (suunnittelu, valvonta ja työnjohto)				16646
Kustannukset yhteensä (ALV 0 %)				397 000
				Total

Peruskunnostettavaa uomaa	9199 m	39,70 €/m (alv 0 %)
Hyötyalueen pinta-ala	296,72 ha	1337,96 €/ha (alv 0 %)

Kaikki yht.	K2, K3	11919 m	yht / €	473 000
		39,68 €/m		
		343,15 ha		
		1378,41 €/ha		



# Costs sharing

K1

Hankkeen nimi Project name				Tnro Project number			Laatija/pvm: Etelä-Suomen				
Loviisanjoki, Loviisa				4396 He 1			Salaojakeskus -JTP /10.04.2017				
K:n,ja tilan numerot	City, Farm, Registration number, Owner Kunta, Kylä, Tila, Rnro, Omistaja	Plot (division) Osittelukuvion pinta- ala ha		Tilan hyötyala ha	Maan- arvo- jyvä	Kuiva- tus- jyvä	Muunnettu hyötyala Kuvio Tila mha mha	Costs Kustannusosuus			
		nro	tiluslaji					%	€		
Drainage area "D1"	K1	Loviisa, Gislomby	Land use ha		Benefit area	Value	Altitude	benefit area			
			18	äker -p	1,86		1,00	0,20	0,372		
			19	äker -p	0,88		1,00	0,30	0,264		
			20	äker -p	0,67		1,00	0,40	0,268		
			21	äker -p	0,16	3,57	1,00	0,50	0,080	0,984	3,19
			50	äker -p	0,38		1,00	0,20	0,076		
			51	äker -p	0,36		1,00	0,30	0,108		
			52	äker -p	1,11		1,00	0,40	0,444		
			53	äker -p	0,20	2,05	1,00	0,50	0,100	0,728	2,36
			14	äker -p	0,45		1,00	0,50	0,225		
			15	äker -p	1,32		1,00	0,40	0,528		
			16	äker -p	0,43		1,00	0,30	0,129		
			17	äker -p	1,57	3,77	1,00	0,20	0,314	1,196	3,87

# Renovation progress

Final plannings and funding application (K1) 28.11.2018

Funding application (K2-K3) 14.12.2018

Decision on the state subsidy (K1) 14.06.2019 and (K2-K3) 19.06.2019

Meeting of the Drainage Corporate body 23.08.2019

Meeting of the Drainage Corporate body Committee on 18.09.2019. The meeting discussed about permission, monitoring and preliminary measurements.

Requests for quotations for water quality, aquatic ecology and fisheries monitoring plans 24.09.2020

Requests for quotations for soil drilling on 18.12.2019

Approval of the water monitoring program 03.01.2020

Approval of the biological monitoring program 26.02.2020

Soil drilling and groundwater impact assessment report 18.05.2020

Installation of a turbidimeter 09.06.2020

Start of harvesting trees and bushes (taking into account the nesting of birds) 10.06.2020

Start of excavation from pl 1700 26.06.2020

We hope the renovation to be a national and international example. The work has been carried out systematically, in accordance with the regulations and taking into account the wishes and needs of different interest groups.



# What have we achieved?

Already renovated:

5500m main channel maintenance and low-flow channel (fishery)

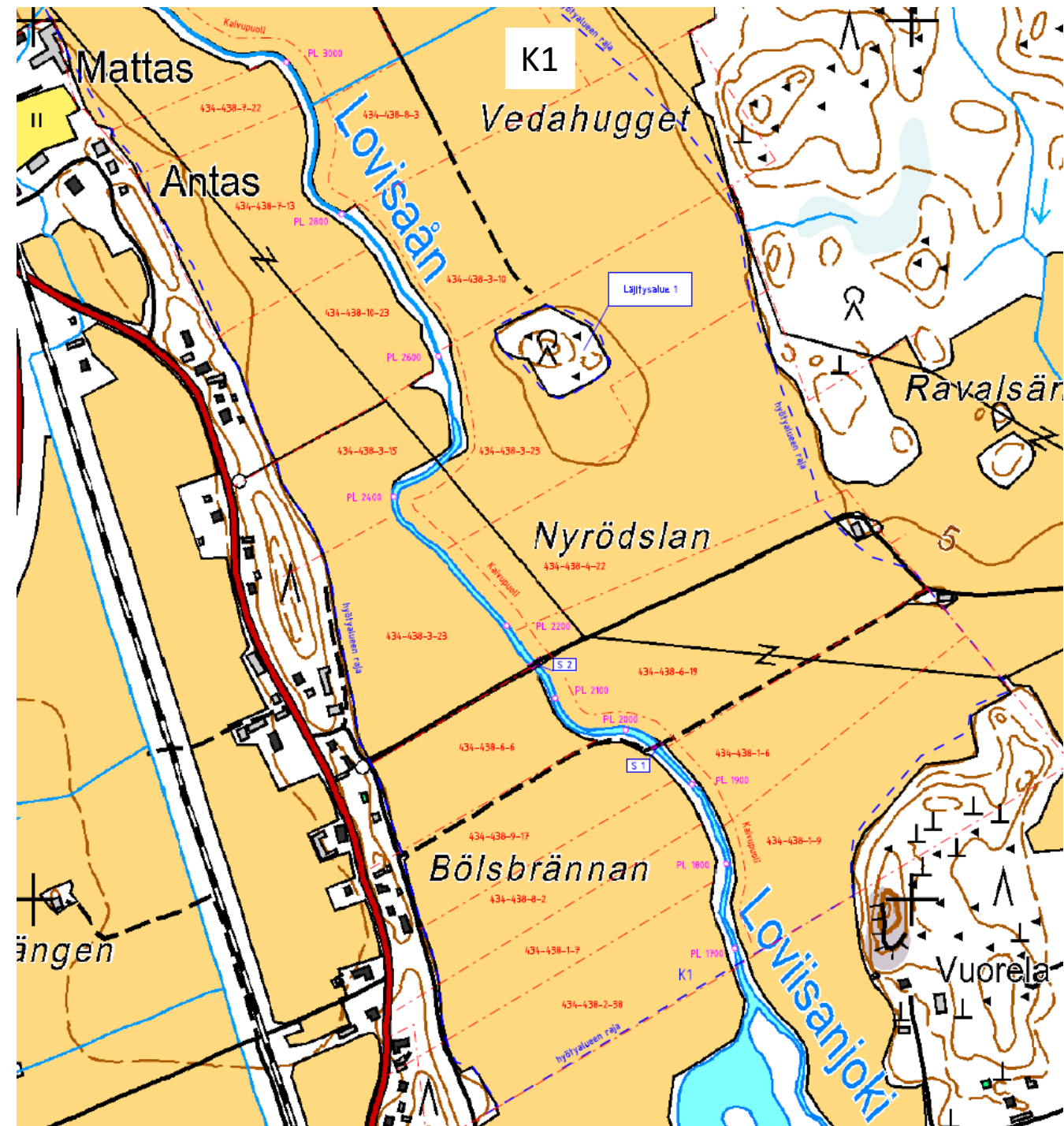
1020m two stage ditches

2 Natural flood stream / fishery restoration

440m protection area (2 valuable rapids)

1 new bridge















Problems were not avoided: Collapses













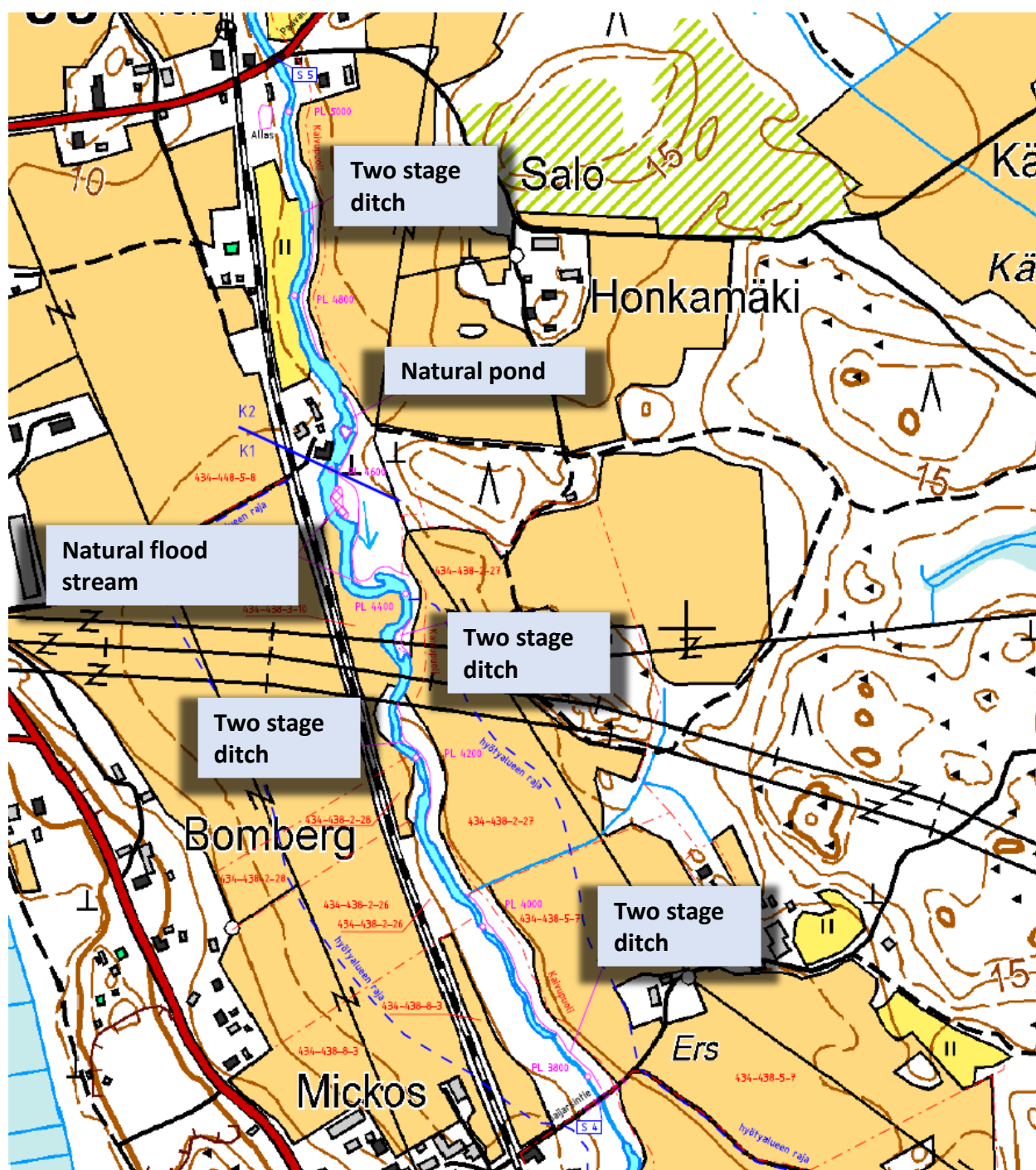




## What gone wrong (collapse)?

- Soil type. The clay on downstream is partly very loose and muddy.
- Landfilling too close to slope caused pressure when trying to avoid crop losses
- Decrease of back pressure in the slope (30cm low-flow channel)
- Decrease of vegetation and root binding in slope (1:2!)
- Groundwater surveys have been carried out, but water is discharged from the slope
- Excavation of wet floodplains / risk of collapse / outflow from excavated floodplains during the overflow period before vegetation
- Low-flow channel fills with sediment during excavation, causes outflow







1km of 2-stage ditch











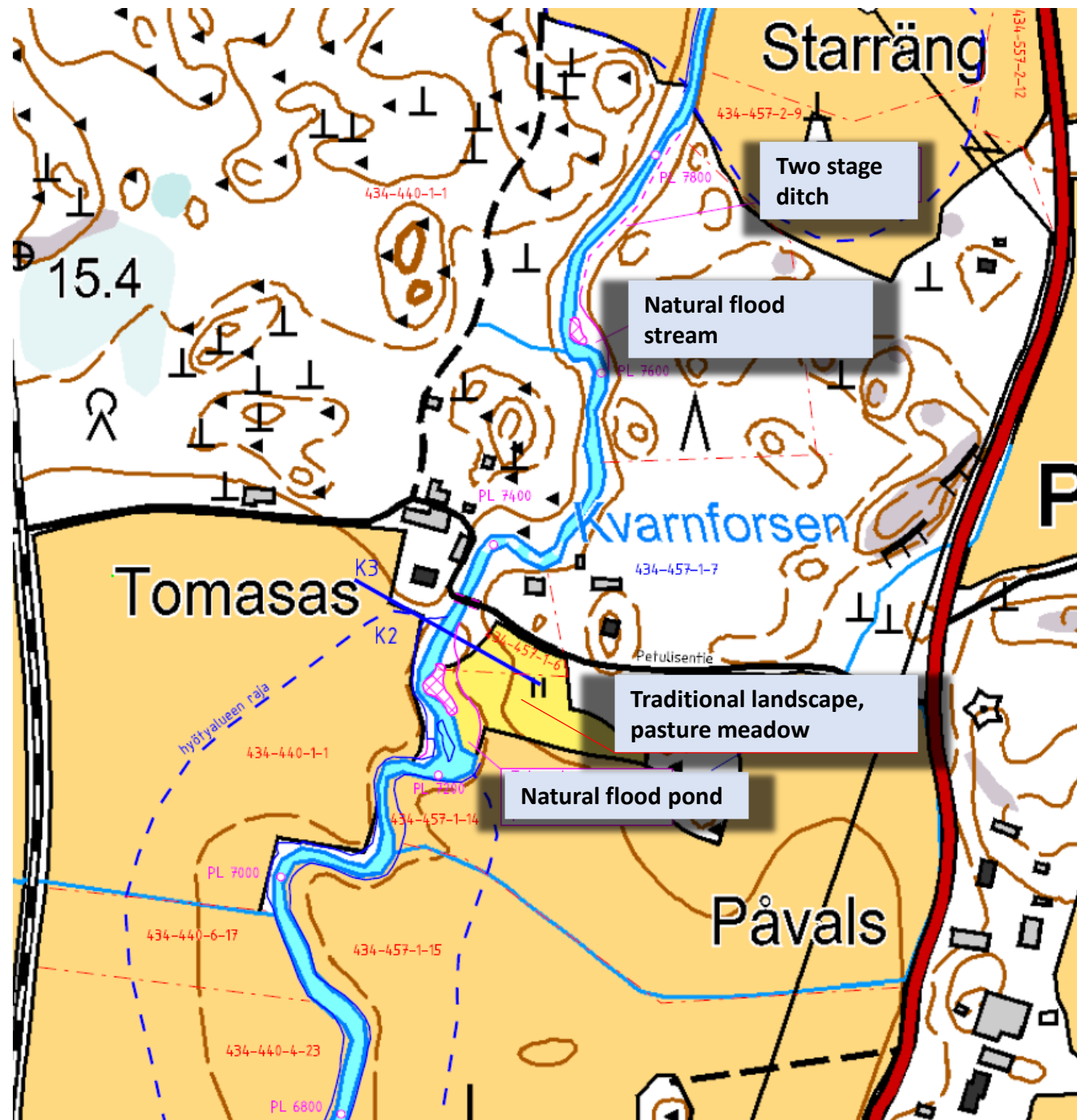






















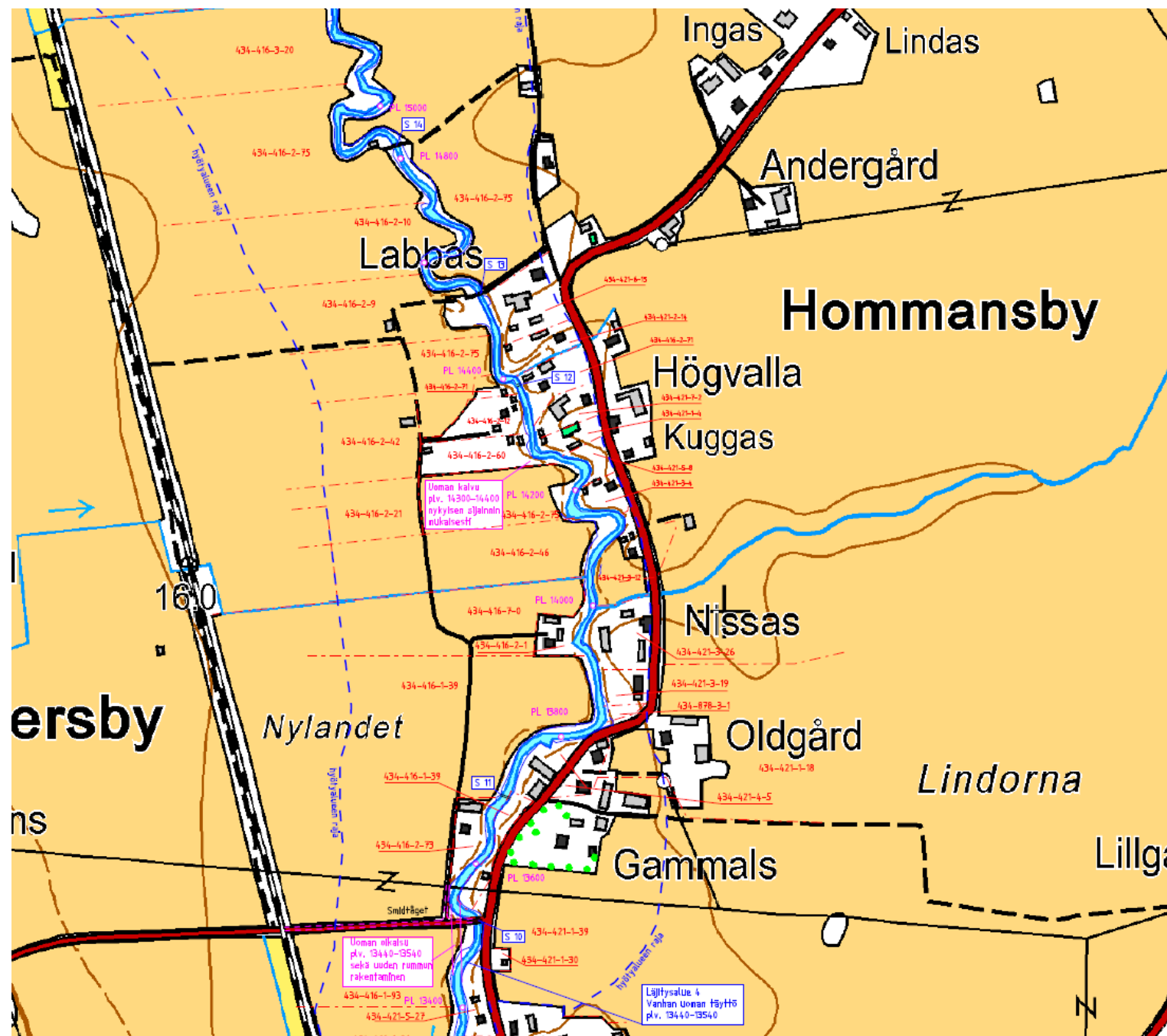






19.10.2020







Protected or not?



The battle continues!



# *Thank you!*



*Waterdrive*

 **Interreg**  
Baltic Sea Region



**KVY**  
Tutkimus Oy



Tampere | Pori | Rauma | Vaasa | Hämeenlinna | Saslamala | Jyväskylä

 **Etelä Suomen**  
**SALAOJAKESKUS**

STØTTET AF

# **Promille**afgiftsfonden for landbrug