Szczecin, 27 October 2015

Report on the study visit to Germany, 12-16 October 2015

The visit took place within the framework of LIFE13 NAT/PL/000009 project Active protection of water-crowfoots habitats and restoration of wildlife corridor in the River Drawa basin in Poland, action A3. Consulting trips to Germany to prepare opposite-leaved pondweed reintroduction in Poland.

The study visit was conducted by the members of LifeDrawaPL project: MSc Eng Artur Furdyna, MSc Eng Elżbieta Hołubczat and PhD Wojciech Puchalski

The lustration area covered north-western Germany, which includes federal states: Lower Saxony, Saxony-Anhalt and Rhine-Westphalia.

The trip's aim was to find current places of occurrence of Groenlandia densa and to preliminary determine a possibility of reintroduction on localities within the framework of LIFEDrawaPL project.

During the trip an overview of some well-know (from the literature, reports, databases, local experts' reviews) places of occurrence of Groenlandia densa was conducted, in the north-west part of Germany, where habitat conditions can be as close as possible to those in the project's area.

Localities Groenlandia densa, Germany, 13-16.10.2015

G1-0 pond in Einzingen, southern Harz, Saxony-Anhalt

Seepage spring area pond in the centre of the village, partly enclosed, probably on the site of the former seepage spring area basin. Numerous scattered shoots of Groenlandia densa in stagnant water to the depth of approx. 60 cm, vertical stems, rarely leafy. Callitriche sp. also present. Gravelly-silty bottom, periodically (every 2 years) cleaned of fallen trees (on the shore of the pond) and excess silt. Temp. 8.8 ºC, oxygen area 10.5, bottom 6.1 $mg.l^{-1}$, pH 7.4, redox water 152 mV, sediment area 84 mV, sediment –257 mV, conductiv. 465 µS.

Locality Groenlandia densa is probably an isolated insular locality here between relict northern populations and well-preserved localities in southern Germany.

Groenlandia densa pond in Einzingen

G2 drainage ditches in the meadows near Osterholz – Scharmbeck, Lower Saxony

Extensive meadows, formerly low bogs (Hammemarsch) drained by a stream Hamme (tributary of the Lesum, the valley of the lower Weserbelow Brema, right side), cut with old, narrow (up to 1m) overgrowing drainage ditches. The ditches supplied from groundwater effusions (described as rich in Ca) from under a moraine (on which the town lies). Irony effusions, clearly distinguished zones with thick sediments of iron compounds; irony suspension in the water. Periodic maintenance of the ditches limited to cutting of meadow vegetation, willow thickets (Salix cinerea) and blackberries.

G2-1 dense irony sediments, a lobe of Groenlandia densa – compact, short stems, densely leafy. Temp. 10.0ºC, oxygen area. 4.6, bottom 6.1 $mg.l^{-1}$, pH 6.8, at the bottom (40 cm) 6.5, redox water 178 mV, sediment -318 mV, conductiv. 209 µS

G2-2 the same trench below, less abundant irony sediments, Temp. 9.0ºC, oxygen area 6.4, bottom 0.0 $mg.l^{-1}$, pH 6.8, redox water 128 mV, sediment –312 mV (there is H2S), conductiv. 209 µS. Single specimens of fruitful pondweed. Other plants in the trenches: Isolepis fluitans (compact lobes), Hottonia palustris, Calitriche sp., Ranunculus flammula, rarely Myriophyllum sp.

G2-3 another, larger trench, in the distance of approx. 400m. Temp. 8.6 ºC, oxgen area 6.5, bottom 2.8 mg.l^{-1}, pH 6.9, redox water 35 mV, sediment –236 mV, conductiv. 224 μS. depth 30 cm, hard bottom. Other plants in the trench: Myriophyllum sp., Elodea canadensis, Hottonia palustris, Chara sp. (sample), Isolepis fluitans, Calitriche sp.

Groenlandia densa in the company of Hottonia palustris and Callitriche in trenches near Osterholz-Scharmbeck

G3 trenches in the area of Hamminkeln near Wesel, the edge of the Rhine valley, Norht Rhineland – Westphalia

The right side of the Rhine valley, between Duisburg and the Dutch border. Through the river's valley local populations may be related to the south-German populations where Groenlandia densa still occurs frequently and is considered not to be at risk of extinction – in contrast to the northern populations (here also the lower Weser valley, the lower Elbe valley and Eider in Schleswig).

G3-1 a trench beside the road, near Hamminkeln, surrounding – meadows, numerous Elodea canadensis, Calitriche sp., Chara vulgaris, Potamogeton crispus; there is Groenlandia densa, but not in mass and does not form compact lobes. On the bank numerous Iris pseudoacorus, Alisma plantago-aquatica. Irony sediments. Temp. 9.6 ºC, oxgen area 4.2, bottom 1.3 mg.l^{-1}, pH 7.3, redox water 56 mV, sediment –283 mV, conductiv. 657 μS.

G3-2 a transverse trench on extensive, mown meadows in the Issel valley near Ringenberg; (formerlow bog) – in the summer the trech is cleaned off vegetation, the bottom covered with irony sediments, single dispersed Groenlandia densa lobes in the trench; there is also Elodea canadensis and Calitriche sp. Temp. 9.6 ºC, oxgen area 2.2, in pondweed's lobe 1.7, bottom 0.8 $mg.l^{-1}$, pH 7.4, redox water –3 mV, in pondweed's lobe 4 mV, sediment –228 mV, conduciv. 596 μS.

Groenlandia densa in trenches near Ringenberg

Negative tests:

1. Headwaters part of Wabe stream, near Braunschweig. The stream in ash and alder marshy meadow, in the area of upland plain built of limestone. In a dry year a very weak flow of water, H2S in the mud, sparsely covered with low Berula, no Groenlandia densa, vanishing water flow at the bottom. Below the following seepage spring area tributaries the flow is greater, gravelly bottom, well-developed, dense Berula erecta and Nasturtium sp. thickets, there is Batrachospermum sp. and moss (samples).
2. The Weser valley, Rader Sand. A trench next to a corn field, a meadow on the other side, cover with Lemna minor, Elodea canadensis and E. nutalli in mass, in the place of water exudation the is also Ceratophyllum and Callitriche. The trenches overgrown with reed; nearby on the section of former Groenlandia densa occurrence numerous Dipsacus sylvestris.

Landscape of Rader Sand

3. A trench on the meadows with grazing cattle, recently cleaned, silty bottom, there is Elodea canadensis, Lemna minor.

A meeting with Klaus van de Weyer and Wilhelm Itjeshorst in Watley

4. Trenches on extensive, mown meadows in the Issel valley, near Ringenberg; former low bog – according to the old K. van de Weyer data in the main trench parallel to the riverbeds numerous poins of Groenlandia densa occurrence marked, currently not

found; there is Elodea canadensis, Calitriche sp., single Potamogeton sp. (sample). In some trenches with flowing water and iron compounds sediments there is Potamogeton alpines in large numbers. Some lateral trenches cleaned recently off aquatic plants (mainly Elodea), possible growth of Groenlandia densa from rhizomes.

Schedule

12.10. departure, accommodation Braunschweig

13.10. stream Wabe near Bsw. [-], pond in Einzingen (Harz, S-A) [G1], accommodation Oyten/Bremen

14.10. Weser valley [-], accommodation Oyten/Bremen

15.10. meadows near Osterholz-Scharmbeck, Hans-Gerhard Kulp, [G2], accommodation Hamminkeln

16.10. Hamminkeln, Watley [-],Issel valley near Ringenberg, Klaus van de Weyer,[G3], return