

Danube Wild Islands, first inventory and assessment

Visegrád, 8.9.2017

Ulrich Schwarz, FLUVIUS, Vienna

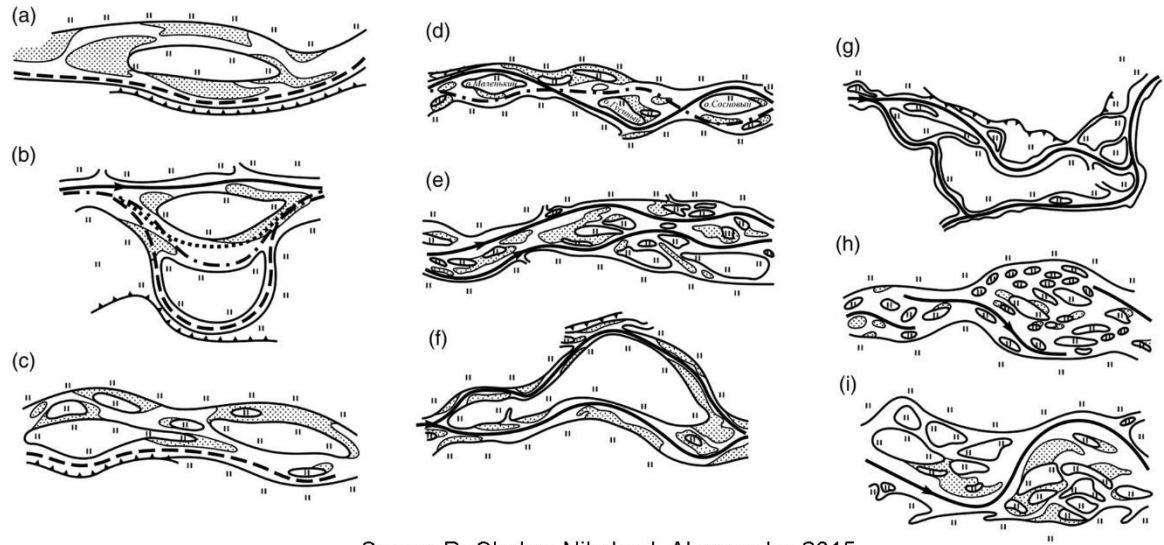


umweltbundesamt^U

DANUBEPARKS
network of protected areas

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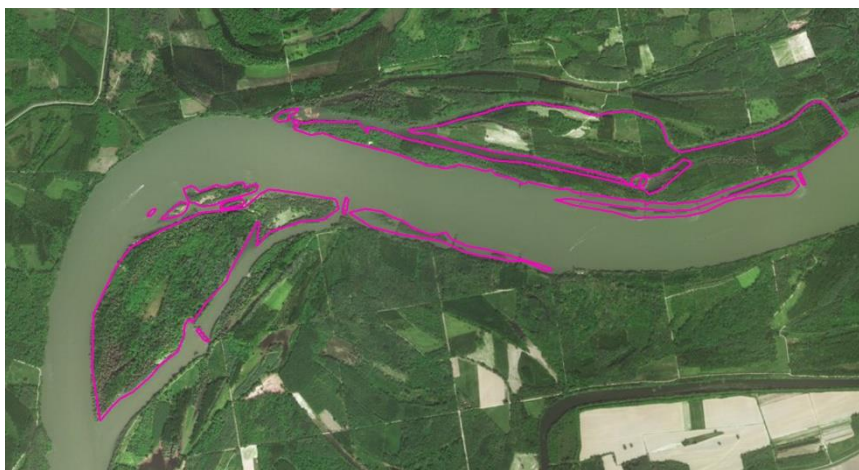
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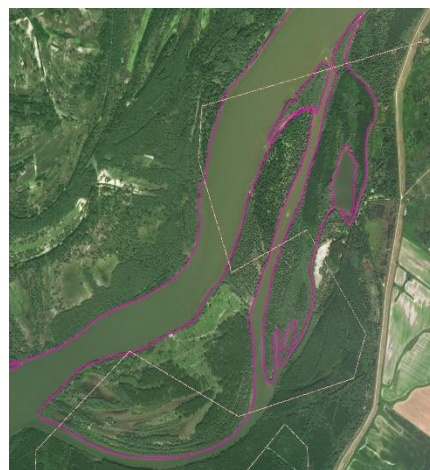
Sergey R. Chalov, Nikolay I. Alexeevsky, 2015

1 Introduction

- Task: Mapping of islands to define Danube Wild Islands
- Inventory and basic assessment for all islands, more detailed preparation of 20-25 pilot islands (1-3 per country)
- Overtake draft map based on Google Earth (529 islands with 9,500 hectares)
- Overtake and discuss pilot islands prepared already by the partners
- Feeding the results into the further project steps toward planning and management (online tool, master plan)



2/15



2 Approach (1/4)

Definition of islands: In general, islands must

- be **permanently surrounded by water** at mean water level: higher cross-dams / bottom weirs at the upper or lower end of a side-arm may alter the islands' hydromorphological dynamics and ease user access, i.e. undermine its natural development and thus its wild character;
- be **covered by some vegetation** (at least pioneer and shrub woody species): single and frequently submerged gravel and sand bars are not recorded, unless they form an integral part of an island group;
- **exist for at least 10 years:** very dynamic small gravel bars and sand banks that much alter their location and size over years may be wild but are hard to inventor and to sustain their protection
- have a **minimum size:** The size of islands basically increases along the Danube river, based on the hydromorphological reference conditions of its main river section types. It is difficult to provide thorough thresholds, except in form of the (expected) mean and average size and configuration of islands. For the purpose of this study, an island's basic size should be **larger than**
 - 0.5 ha along the Upper Danube**, though smaller islands on groynes were recorded down to about 0.1 ha;
 - 1 ha along the Middle Danube** (Morava river to Iron Gate)
 - 5 ha along the Lower Danube.**

Approach (2/4)

Mapping of islands

- All islands are mapped at a scale of at least 1:10,000 based on contemporary high resolution satellite images as well as on available national orthophoto from about 2006 to 2017 and to determinate the island origin further images and maps since about 1900.
- The envisaged „mean water level“ criterion is visually determined by comparing multi-temporal images. Finally the polygons will be used to generate “centroids” to allow a simplified point visualisation on the one hand for the overview but also to further subdivide the island polygons for the targeted 20-25 pilot islands to allow a more precise land structure/habitat mapping.

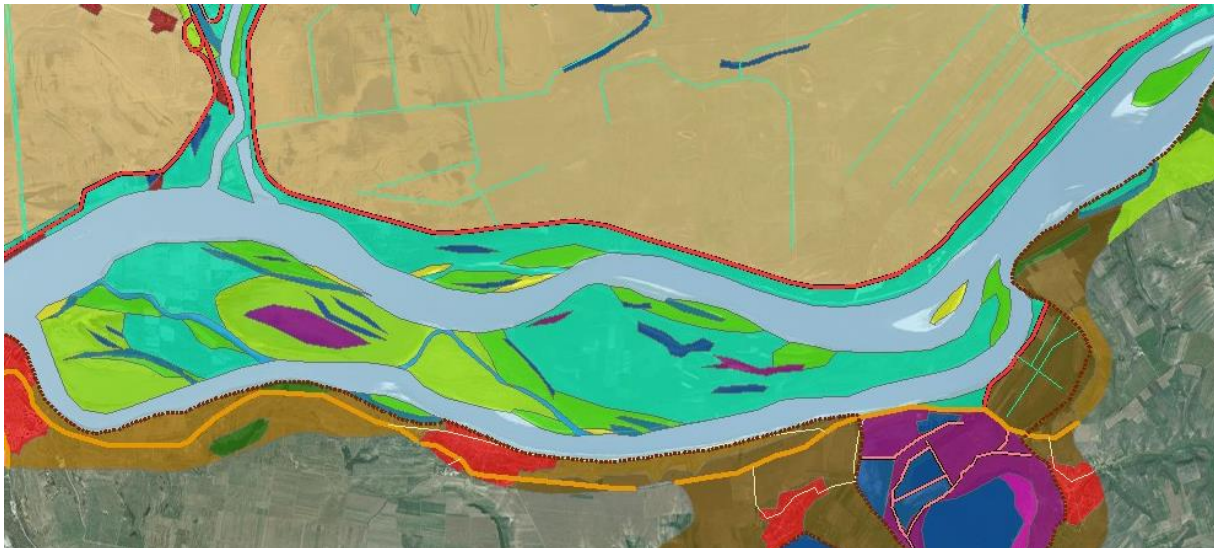
Approach (3/4)

Inventory Parameters

- **Identification code** of each mapped island, including the two-digit country ISO code and a three-digit numbering (1-999) the local **name** (if available)
- **Size** in ha
- **Island origin** of its creation:
 - a) natural **active process** in the active channels,
 - b) islands resulting or remaining after the **mean water correction** (rectification establishing one channel),
 - c) **islands developing on groynes and guiding walls (low water correction)** (initial artificial structures or entirely based on artificial material (stones)
- **Basic land structure** (cover of habitats and land use): up to the three main habitats are simply identified from the satellite image, starting with the one taking the largest coverage. List of habitats: Softwood (including willow shrub), hardwood, forest plantations (mostly poplar, including clear-cuts/fresh plantations), pioneer vegetation, open gravel and sand bars (including dry channels), waterbodies (oxbows), swampy vegetation of succession (reed), wet grasslands, agricultural fields, roads, hydraulic structures (groynes, guiding walls, riprap, cross dikes, sediment deposits), buildings.
- **JDS3 hydromorphological “overall” assessment** of 10 rkm river sections as a key background information, indicating the degree of natural river dynamics: 1 (*near*) *natural*: blue, 2 *Slightly modified*: green, 3 *Moderately modified*: yellow, 4 *Extensively modified*: orange, 5 *Severely modified*: red
- **Overall identified island character**: A summarizing assessment of all Danube islands will specify:
 - a) **wild island** showing no human intervention
 - b) **candidate island** with high potential to become a wild island (Hymo classes 4 and 5 are excluded)
 - c) **all other islands**.

Approach (4/4)

For the targeted **20-25 pilot wild islands** the land structure mentioned above will be indicated in detail (distribution and coverage in %). Further the general **structure of landownership** (small parcels or large sections) will be shown, based on national cadastral information systems. Finally, a description with the **specific characteristics** of each island based on input of partners and stakeholders will complement the inventory information (compare existing pilot proposals).



Results (1/8)

Overall **DRB map** (point features) with all identified islands

Detailed maps (with countries, showing all polygon features)

Both maps/series can show the listed parameters

Inventory file (*long list*) and analysis of inventory results (charts, text)

Pilot islands (*short list*):

Target of 1-3 islands per riparian country (i.e. 20-25 in total)

Extended parameters: land structure classes in percentage, landowners

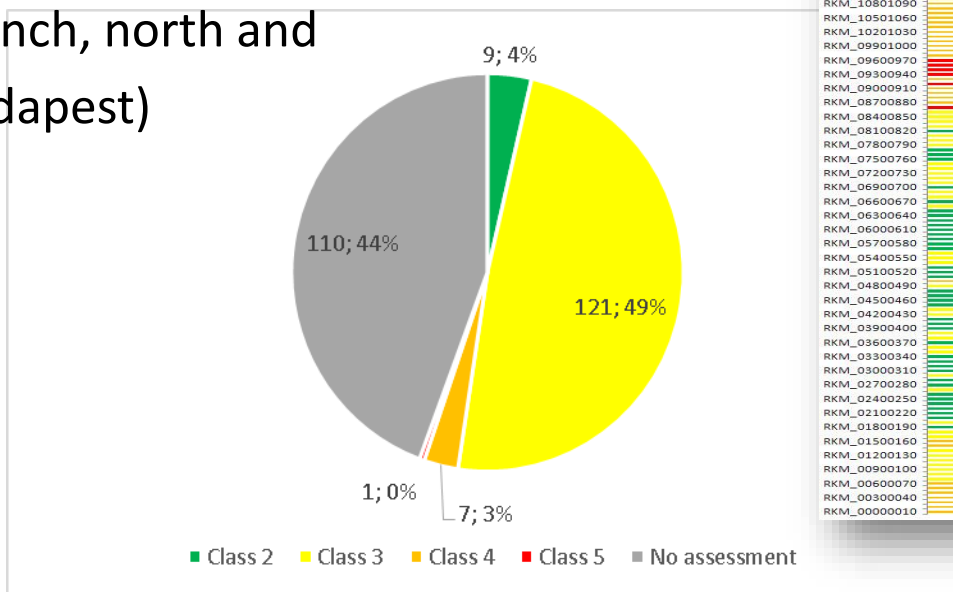
Results, example Hungary (2/8)



249 islands with
an area of 6.048 ha

Results, example Hungary (3/8)

First „entire“ assessment for the parameter of Hymo JDS 10 rkm segments („no assessment“ for the main side branches, such as Szigetköz, Szentendre and Ráckeve branch, north and south of Budapest)



RKM_24102415
RKM_23802390
RKM_23502360
RKM_23102330
RKM_22802290
RKM_22502260
RKM_22202230
RKM_21902200
RKM_21602170
RKM_21302140
RKM_21002110
RKM_20702080
RKM_20402050
RKM_20102020
RKM_19801990
RKM_19501960
RKM_19201930
RKM_18901900
RKM_18601870
RKM_18301840
RKM_18001810
RKM_17701780
RKM_17401750
RKM_17101720
RKM_16801690
RKM_16501660
RKM_16201630
RKM_15901600
RKM_15601570
RKM_15301540
RKM_15001510
RKM_14701480
RKM_14401450
RKM_14101420
RKM_13801390
RKM_13501360
RKM_13201330
RKM_12901300
RKM_12601270
RKM_12301240
RKM_12001210
RKM_11701180
RKM_11401150
RKM_11101120
RKM_10801090
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RKM_01500160
RKM_01200130
RKM_00900100
RKM_00600070
RKM_00300040
RKM_00000010

Results, example Hungary (4/8)

JDS3 10 rkm „overall Hymo assessment“ segments overlay (extract)

- Layers
- NUTS_BN_01M_2013
- STAT_LEVL_CODE
- Country
- DanubeWldislands
- JDS_Hymo
- 10rkmHymoEvaluSegments
- World_Imagery



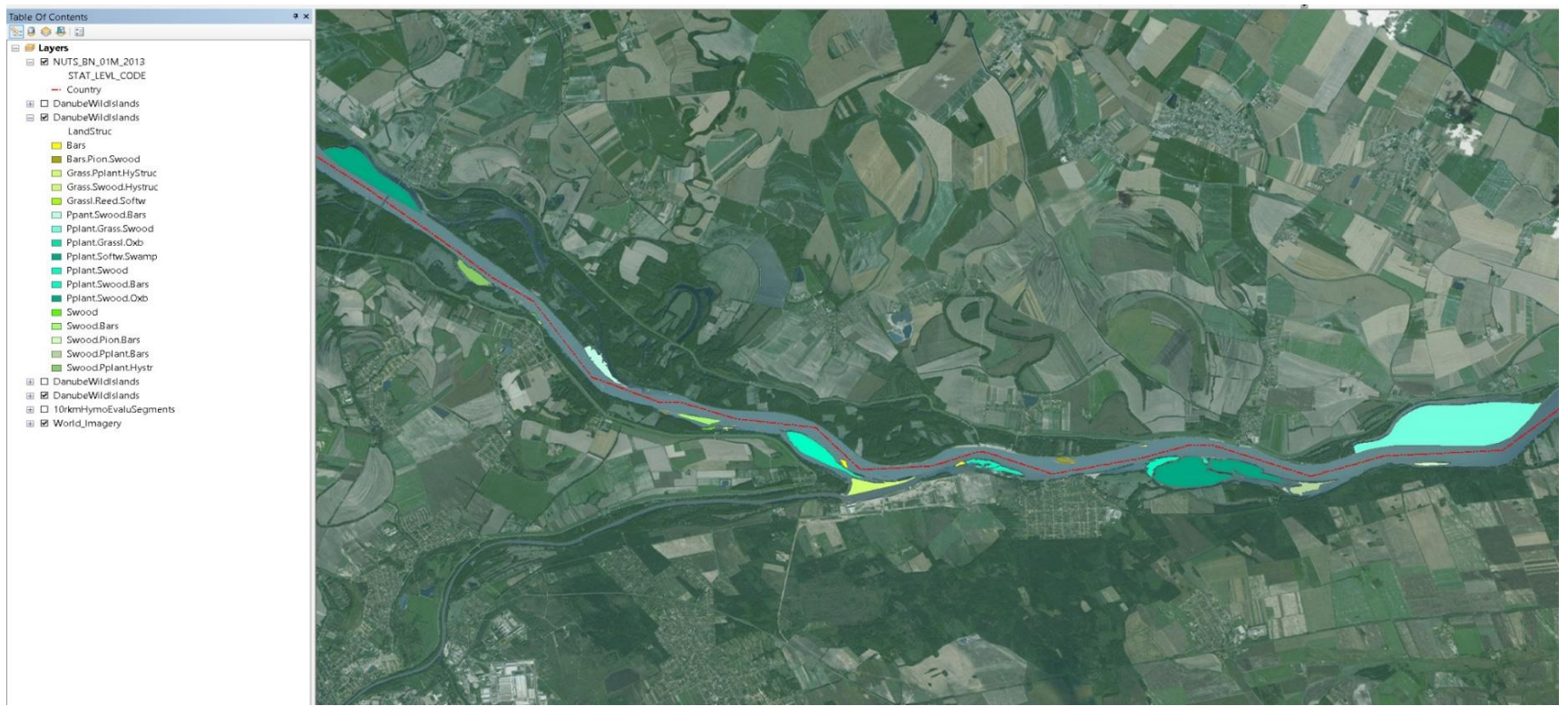
Results, example Hungary (5/8)

Island origin



Results, example Hungary (6/8)

Land structure (up to the first three main land structure types)



Results, example Hungary (7/8)

Island Character



Results, first assessment of already proposed wild islands (8/8)

DE1-3 (Vilshofen-Passau): C (because Hymo in class 4, land structure (includes partial agricultural areas), island protected by riprap . Proposal: Only the islands near and upstream Deggendorf (e.g. at highway bridge) would have a certain potential (class B), further the gravel bars within Weltenburger Enge are too small, same for one gravel bar downstream Isar mouth (but the last remaining natural features in German middle and downstream reach of Danube).

DE4: Neuburg: C: within impoundment of hydropower plant and origin B (mean water regulation). Proposal: Only a very few natural islands remain on upper Danube, e.g. near Sigmaringen (or near Beuron and Donaueschingen)

AT1 (Wachau): B (restoration, some remaining regulation work)

AT2 (Wolfsthal): B (origin B, remaining regulation work)

SK: B (for restoration, actually only connected downstream, Hymo 3, Origin B, land structure is good). Proposal: Two islands just upstream of the proposed island for restoration.

HU1 (Danube bend): A

HU2 (Baja): B (origin B, Hymo 3). Proposal: Island complex downstream of Baja

HR: A

RS: C not permanently connected upstream, harbour basin adjacent , land structure (origin C). Proposals: huge island complex downstream of Apatin

BG: A (most natural island proposed)

RO: B (origin MW correction B, cut-off meander). Proposal: two or three islands in main channel of Sf. Gheorge branch, e.g. 7 km downstream Sulina branch entrance, additional islands Danube RO-BG and Small Braila island

UA: ??? Would be very interesting as many islands in Kilia branch and highest morphological activity in the front delta

Conclusions

- First time comprehensive island inventory. All together we expect up to 2,500 islands to be basically assessed (middle of October).
- Show different types of islands with their wild or altered character within the main river section types along upper, middle and lower Danube (and country wise)
- Allow the determination of Wild Islands and potential wild islands (short list) for further field investigations and management
- Will strengthen the habitat corridor and potential restoration planning along entire Danube (including long list of all islands and extensive restoration potential for many islands)
- Strong linkage to hydromorphological conditions and WFD, better understanding of morphological processes