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Offset Planning: Green Infrastructure Case Studies

Green infrastructure as a biodiversity offset

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Presentation Outline



- Biological offsetting: aims, EU legislation,
- Ethical and practical dilemmas of biodiversity offsets
- Case study: Hydro power plants on Sava River (Slovenia)
- Results
- Conclusions & Recommendations

Biodiversity offsetting – aims and legislation



- Actions to compensate for the loss of biodiversity at an impact (development) site by generating ecologically equivalent gains elsewhere (i.e. an offset site).
- EU Biodiversity Strategy to 2020: no net loss of biodiversity and ecosystem services.
- Natura 2000 network (Birds and Habitats Directives): compensation measures in the case of overriding public interest: creation or improvement of habitat elsewhere to maintain the integrity of the network.

Biodiversity offsetting - dilemmas



Ethical paradox: cultivation of nature as a conservation principle?

- Denies some of the inherent values of nature (i.e. wilderness, dynamics)
- Involves anthropocentric valuation of Nature (which species/habitats are prioritized?)

Biodiversity offsetting - dilemmas



Conceptual inconsistency:

- Addresses global problems at local level
- Initiates vicious circle of offsetting (agricultural land, forest)



Biodiversity offsetting - dilemmas

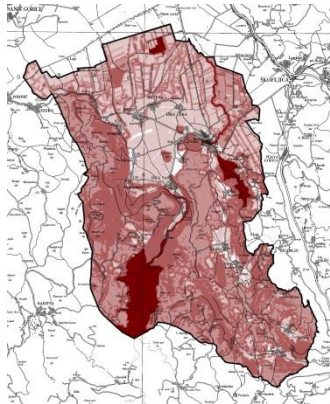


Implementation problems:

- Limited effects of biodiversity offsets (i.e. replacement habitats) due to maintenance problems.
- Stakeholder disagreement
- Considerable costs.

alternative route	»1A«	»2A«	»OC«	»LISIČJE«	reconstruction of existing HW	LISIČJE + reconstruction
Costs (mio €)						
Building costs	32,2	31,9	43,6	33,3	77,3	110,6
Biodiversity offsets	77,2	60,5	52,7	0,0	0,0	0,0
archeology	12,4	10,3	9,8	0,3	0,1	0,4
together	121,8	102,7	106,1	33,6	77,4	111,0

Mitigation hierarchy



vulnerability analysis



Landscape planning



Wildlife over/under passes



Renaturation measures

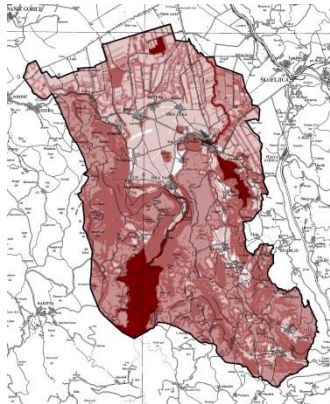
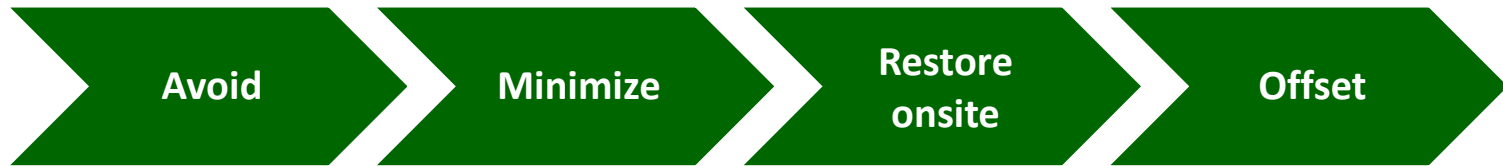


Replacement habitat



Ecological engineering / design

Mitigation hierarchy



vulnerability analysis



Wildlife over/under passes



Renaturation measures

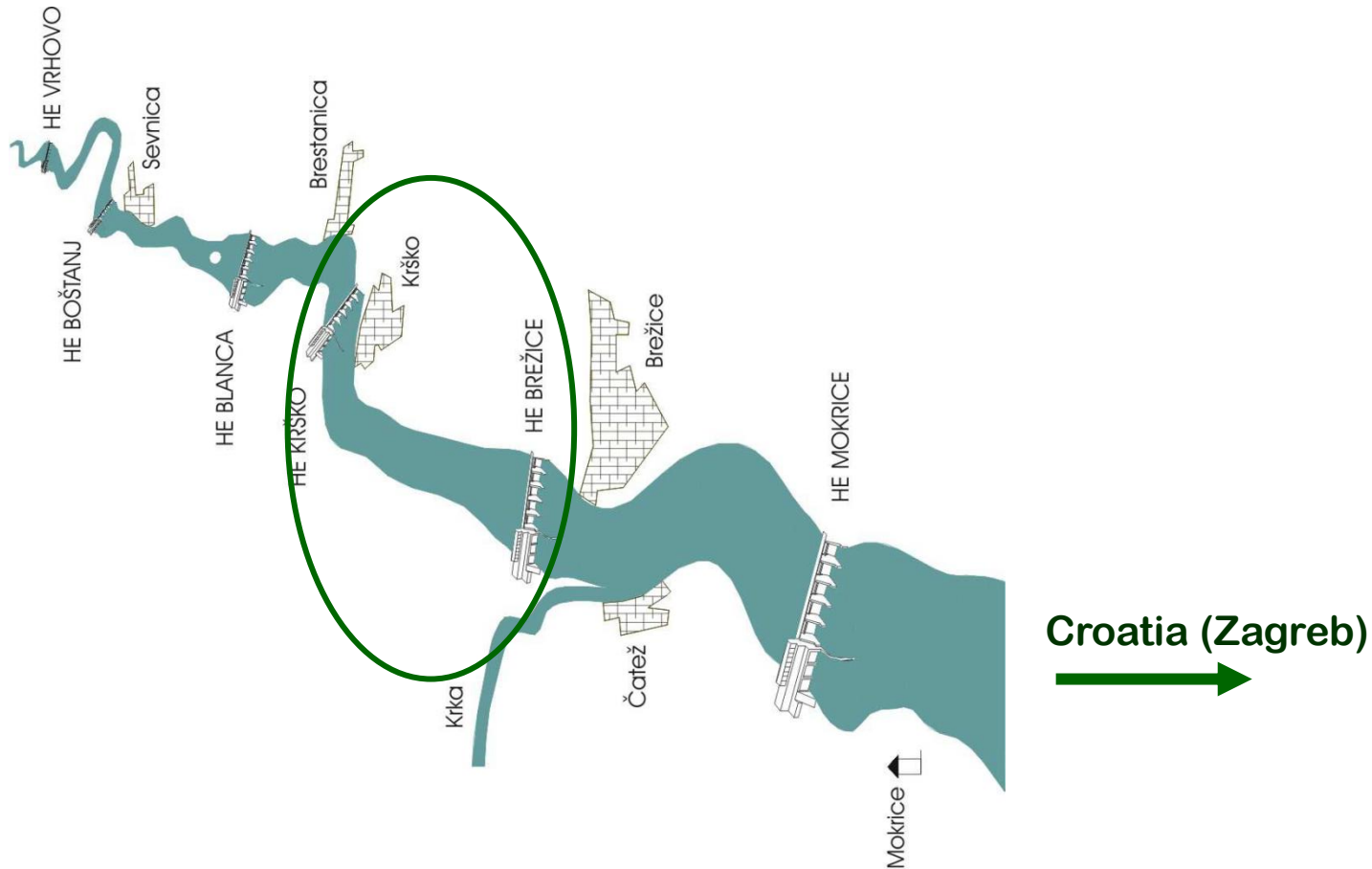


Replacement habitat

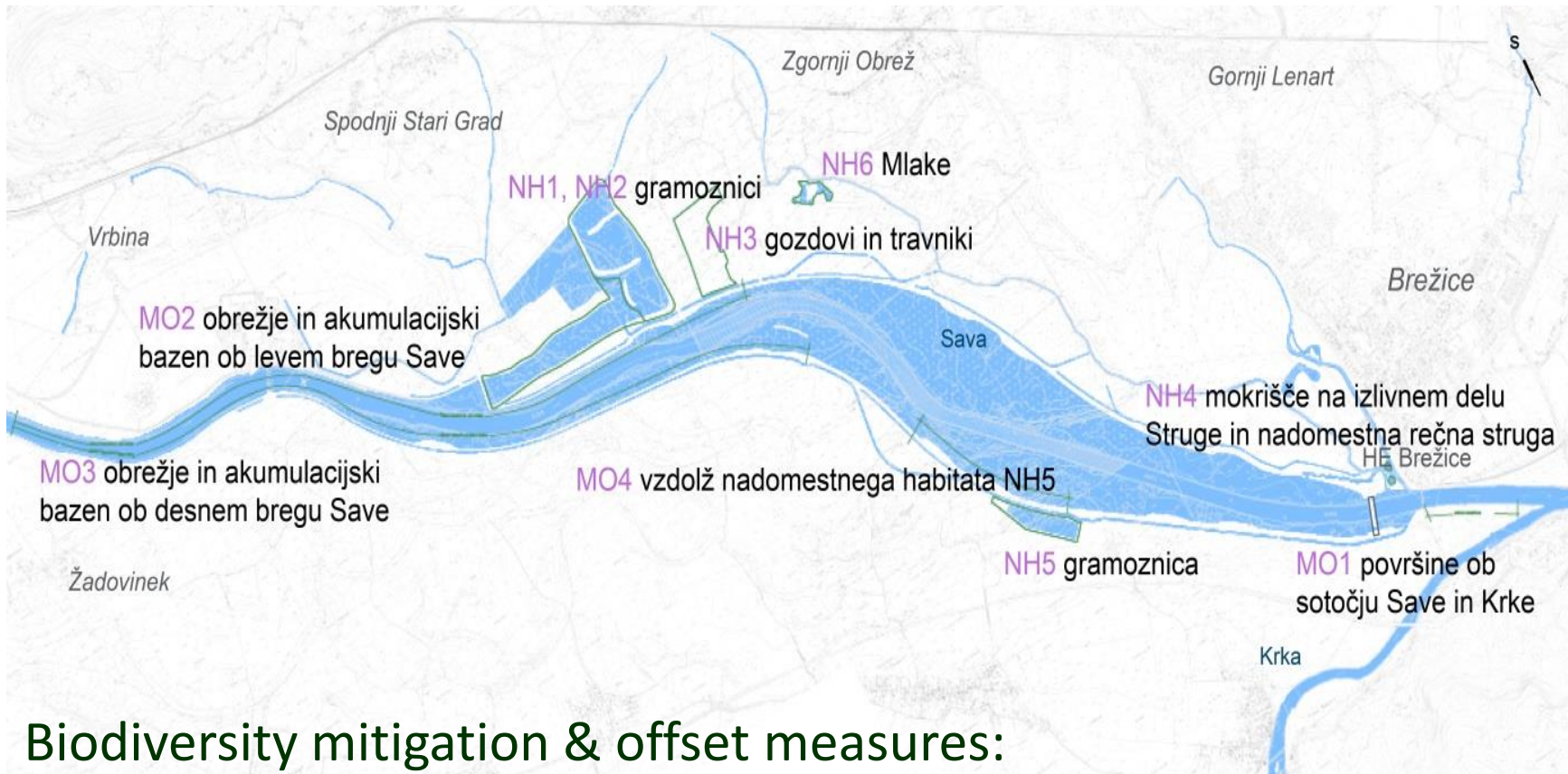
↑
Landscape planing

↑ ↑ ↑
Ecological engineering / design

Case study: Hydro power plants Krško & Brežice on Sava river



Case study: Hydro power plants Krško & Brežice on Sava river



Biodiversity mitigation & offset measures:
4 peace zones (MO)
6 replacement habitats (NH)

Biodiversity offsets as green infrastructure



- Integration of other functions with biodiversity offsets would not impede the nature conservation function, but enhance the implementation and maintenance.
- In the long term, it would also improve nature conservation by raising awareness of the value of nature among people

Method



- suitability evaluation of the offset sites for multifunctional use
- choice of the compatible use(s) for each site
- developing the landscape plan:
 - connecting the sites with recreation paths
 - developing the site design
- evaluation of the plan
 - by the experts
 - by the stakeholders
 - by monitoring

Results: suitability evaluation

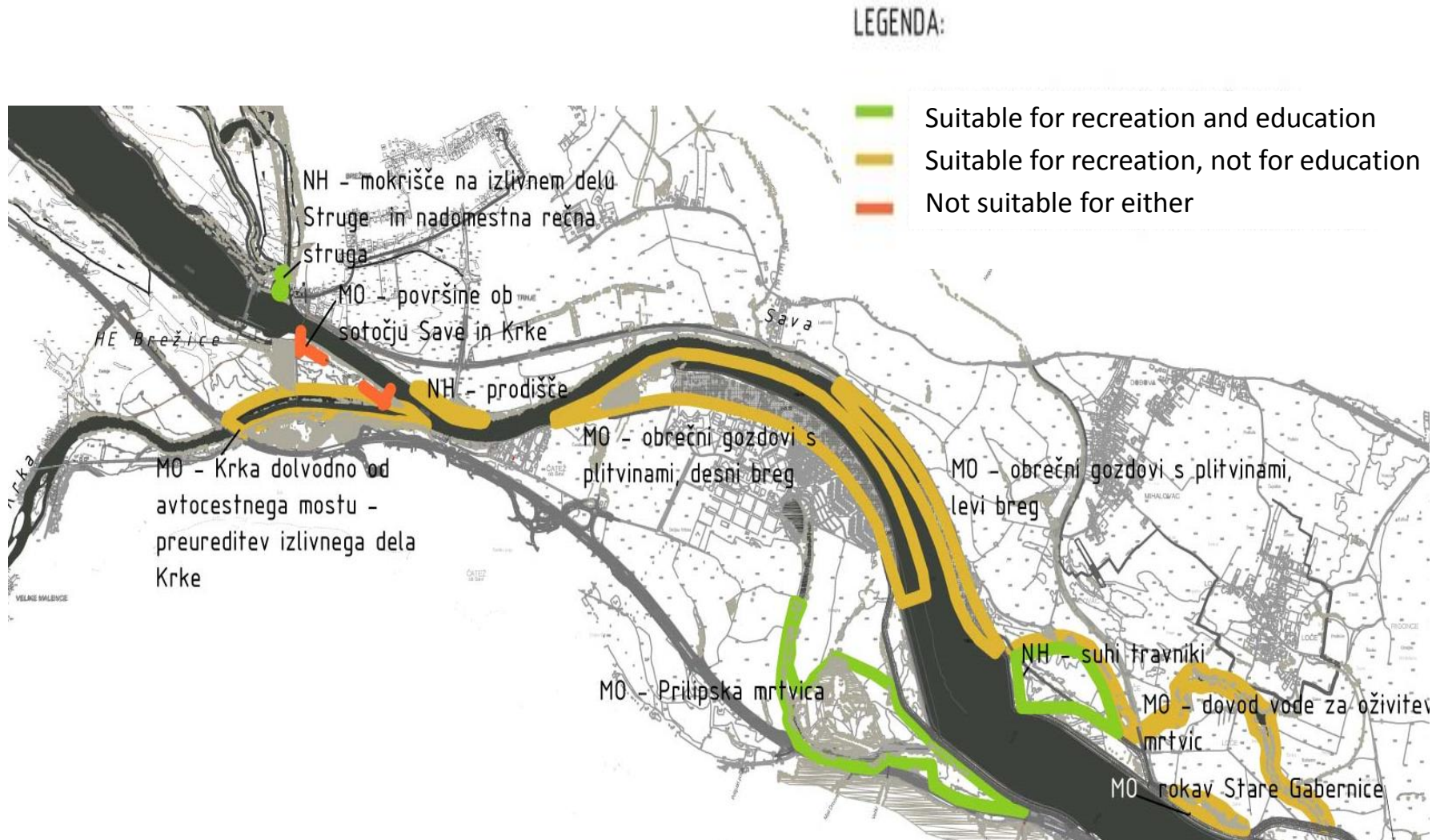


RH wetlands at outlet and replaced river bed (HPP Brežice)

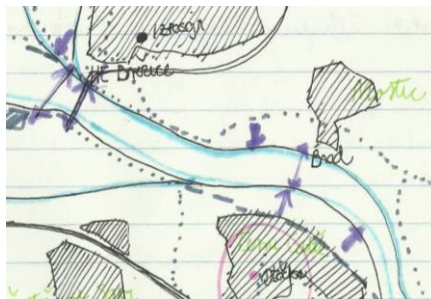
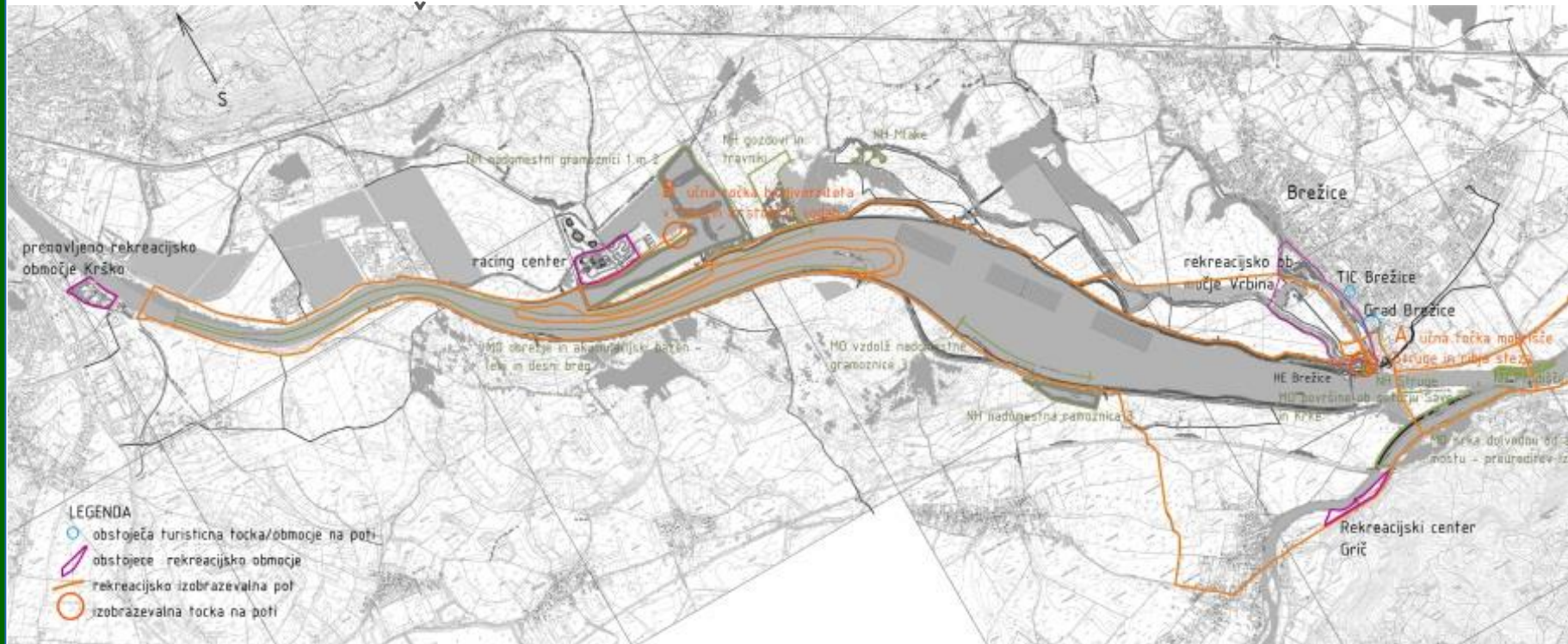
<i>Education criteria</i>	Education value	A	Nadomestna rečna struga oz. ribja steza. Izjemna živalska in rastlinska vrstna pestrost in možnost ogleda zavarovanih vrst, še posebej npr. dvoživk (rosnica), mehkužcev in rakov (navadni škržek, navadni koščak), in vidre. Topolovi nasadi. Stara in odmirajoča drevesa, ki se jih bo preneslo iz območja, ki bo potopljeno, zaradi saproksilnih vrst habitatov.
	Accessibility	A	Ob strugi bi bilo nezahtevno urediti poti, nezahtevna bi bila tudi ureditev za dostop invalidov, večjih skupin in otrok.
	Nature vulnerability	B	Ureditve Struge in Močnika (čiščenje struge, utrjevanje brežin in dna, postavitve prodnih zadrževalnikov...) bi temeljito spremenilo geomorfološke (sestava in zgradba tal ter brežin), hidrološke (vodni režim, vodnatost) in ekosistemske (habitat vodnih in obvodnih organizmov) prvine potoka Struge. (Okoljsko ... Brežice, 2011)
<i>Recreation criteria</i>	Experiential value	A	Ob ustrezni ureditvi bi bila doživljajska vrednost izjemna, saj poleg vodnega ambianta potencialni prostor ureditve rekreacijskih površin nudi še izjemne poglede na staro mestno jedro Brežic in na grad Brežice, na topolove nasade in prostrane travnike in njive. Stara odmrta drevesa, ki predstavljajo habitat bi se lahko uredila tudi kot igrala – s tem bi seveda izgubila NV funkcijo.
	Geographic features	B	Možni so trajni vplivi izvedbe prevezave struge Močnika v potok Strugo: zmanjšanje pretoka in vodnatosti Močnika, ter spremembe hidroloških in morfoloških značilnosti (vodnega režima in naravne dinamike) obeh potokov in rečnega odseka krke dolvodno od jezua v Krški vasi. (Okoljsko ... Brežice, 2011)
	Nature vulnerability	B	V posebni študiji je bilo evidentiranih veliko vodnih in kopenskih habitatov rosnice, na katero bo rekreacija negativno vplivala. Z ustrezno ureditvijo območja in izborom termina gradnje je negativne vplive mogoče omiliti. Pri gradnji javne kolesarske povezave bo v primeru, da bo ozka in neutrjena (ne asfaltna), vpliv nebitven. Pri ureditvi rekreacijske rabe naj se upoštevajo sezonske, časovne in prostorske omejitve glede na ekološke zahteve prisotnih vrst. (Okoljsko ... Brežice, 2011)

↑ Criteria
 ↑ rank
 ↑ argumentation

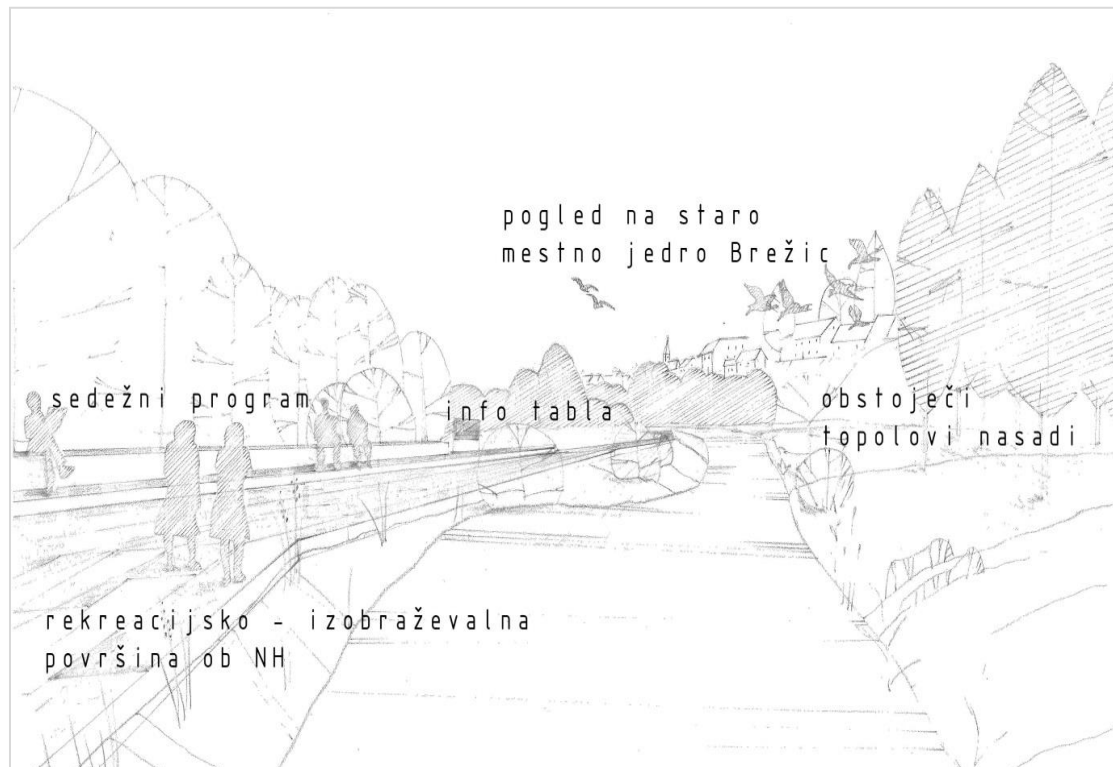
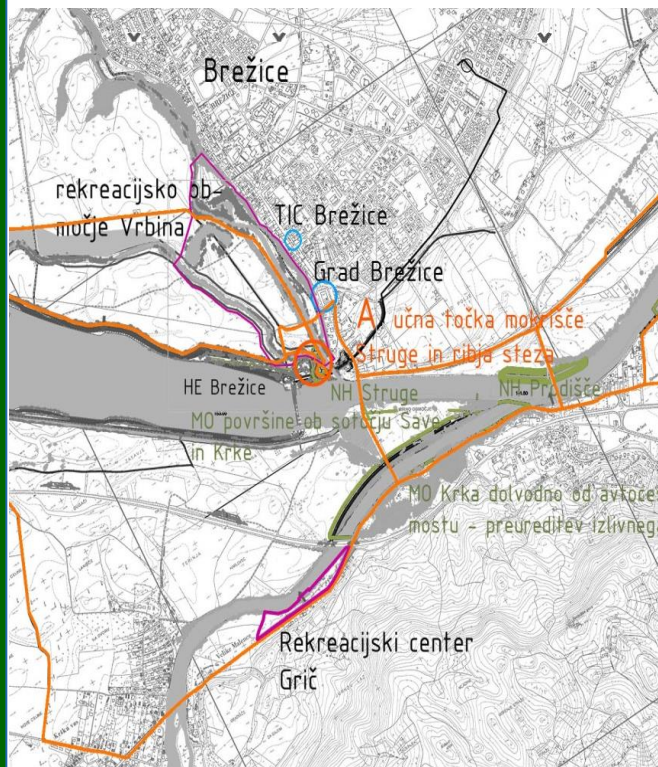
Suitability evaluation - results



Landscape plan: recreational – interpretative trail



Site design: Information point: wetlands and fish path



Evaluation of the proposal



Structured interviews with experts / consultants, public officers

- **Martin Žerdin**, msc., Aquarius d.o.o.;
- **Zoran Stojič**, msc., Geateh d.o.o.;
- **prof. Mihael Jožef Toman**, PhD, Biotechnical Faculty, Ljubljana University;
- **prof. Janez Marušič**, PhD, Biotechnical Faculty, Ljubljana University (retired);
- **Peter Skoberne**, PhD , Triglavski national park
- **Vesna Kolar Planinšič**, msc., Sector for SEA , Ministry for agriculture and environment;
- **Jelka Habjan**, Sector for SEA , Ministry for agriculture and environment;
- **Jure Likar**, Sector for SEA , Ministry for agriculture and environment;
- **Jelka Hudoklin**, msc., Acer d.o.o.;
- **Lucija Simončič**, Acer d.o.o.;
- **Sonja Rozman**, National agency for nature conservation, Kranj;
- **Tina Klemenčič**, National agency for nature conservation, Ljubljana;
- **Barbara Radovan**, Sector for national spatial planning, Ministry for infrastructure and spatial planning
- **Micheal O´Briaian**, PhD, Natura 2000 Unit, Directorat general environment, EC.



Conclusions

Mixed practice and experience of biodiversity offsetting in Slovenia:

High cost / vague benefits

Benefits could be increased by integrating compatible ecosystem services with biodiversity offset sites (recreation and education in the pilot area, other possible: climate mitigation, water regulation)

Positive effects include:

- better and more long term maintenance
- increased awareness of society about nature conservation.

Conclusions



1. Mitigation hierarchy should be (more) strictly respected and applied
2. If offsetting is unavoidable:

optimization,
planning,
integration

instead

standardization
environmental
engineering
monosectoral

Thank You & Questions?

