

Ecology of longitudinal training dams in the river Waal

F.P.L. Collas, A.D. Buijse, A.J. Hendriks, R.S.E.W. Leuven

Challenges

Ecosystem services and functions of rivers are increasingly under pressure. To support **sustainable river management** integrative measures are required. One such measure are **longitudinal training dams**, stony structures build parallel to the river shore thereby separating the river into a main channel and a shore channel (Fig. 1). These dams are expected to have several **positive effects** e.g. (1) increase **discharge capacity** for improved flood safety; (2) increase and maintain minimum water depth for navigation during **drought**; (3) reduce fairway maintenance **costs** and (4) create sheltered conditions for riverine **species**. As part of this project the ecological development near the LTD was assessed.

Innovative components

- Monitoring of inland shipping related environmental conditions in rivers (e.g. underwater sound levels [Fig. 2], stability of dynamic conditions).
- Monitoring of fish, macroinvertebrates and aquatic macrophytes (Fig 3).
- Development of ecological models (species sensitivity distributions, SSDs) that can be linked with hydromorphological models.

For whom and where?

Any manager / researcher / professional interested in riverine ecology. The monitoring results can be applied at a global scale. The ecological models are focused on the European continent with special attention for the river Rhine.

Application development and findings

- The longitudinal training dam mitigates the negative abiotic effect of inland shipping while simultaneously facilitating an increased usage of the main channel.
- Fish and macroinvertebrate densities and diversity are increased in the shore channel compared to nearby reference groyne fields.
- The developed SSDs can be used to predict the potentially occurring fraction of riverine species based on measured or predicted abiotic conditions (e.g. flow velocity, water temperature, water depth).

Next steps

Continuation of the monitoring of the abiotic and ecological development of the shore channel combined with a further integration and application of the ecological models in case studies (suggestions welcome).



Figure 1: Photo of one of the longitudinal training dams constructed in the river Waal near the municipality of Dreumel

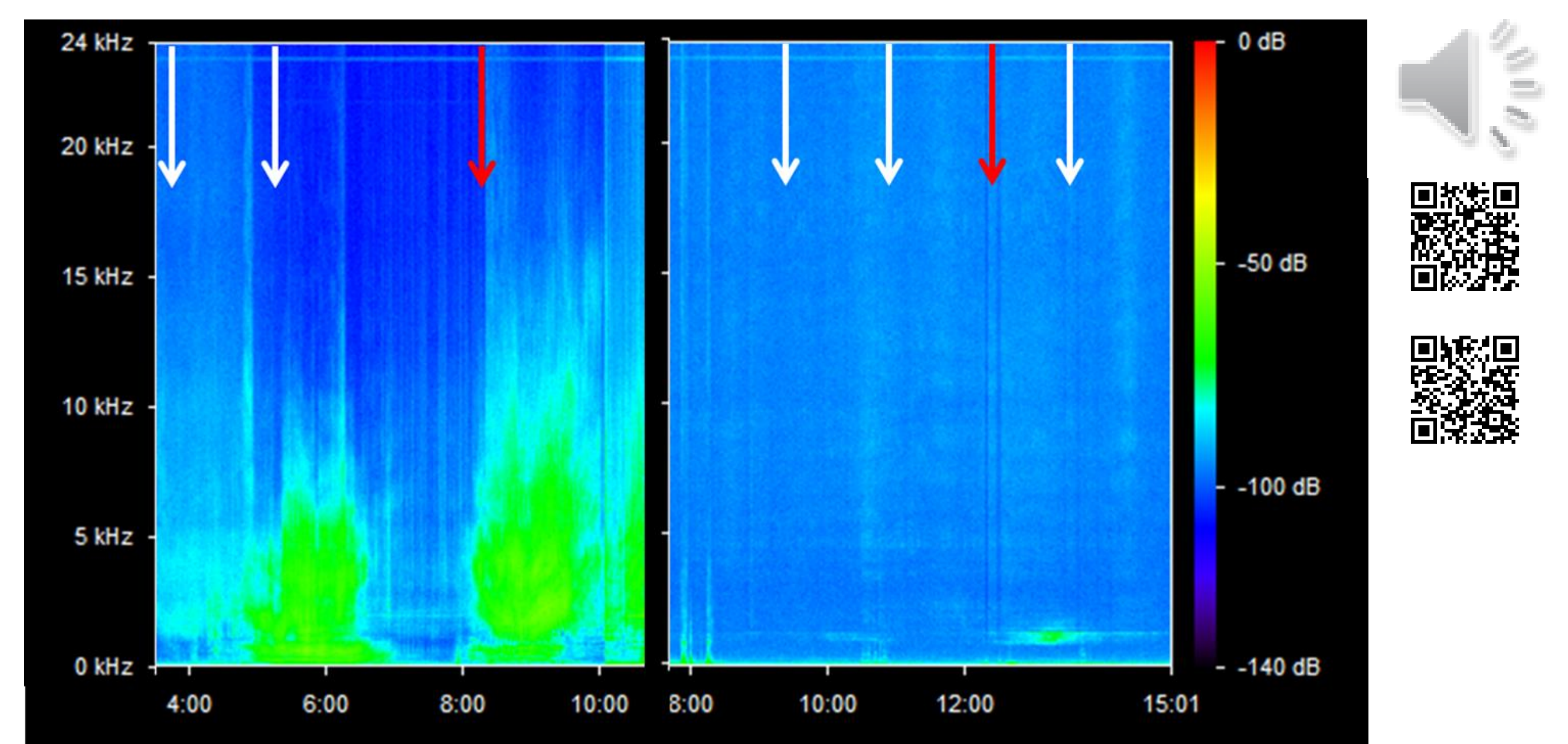


Figure 2: Relative underwater sound levels of passing inland navigation (indicated by arrows) in a traditional groyne field (left panel) and in the shore channel (right panel)

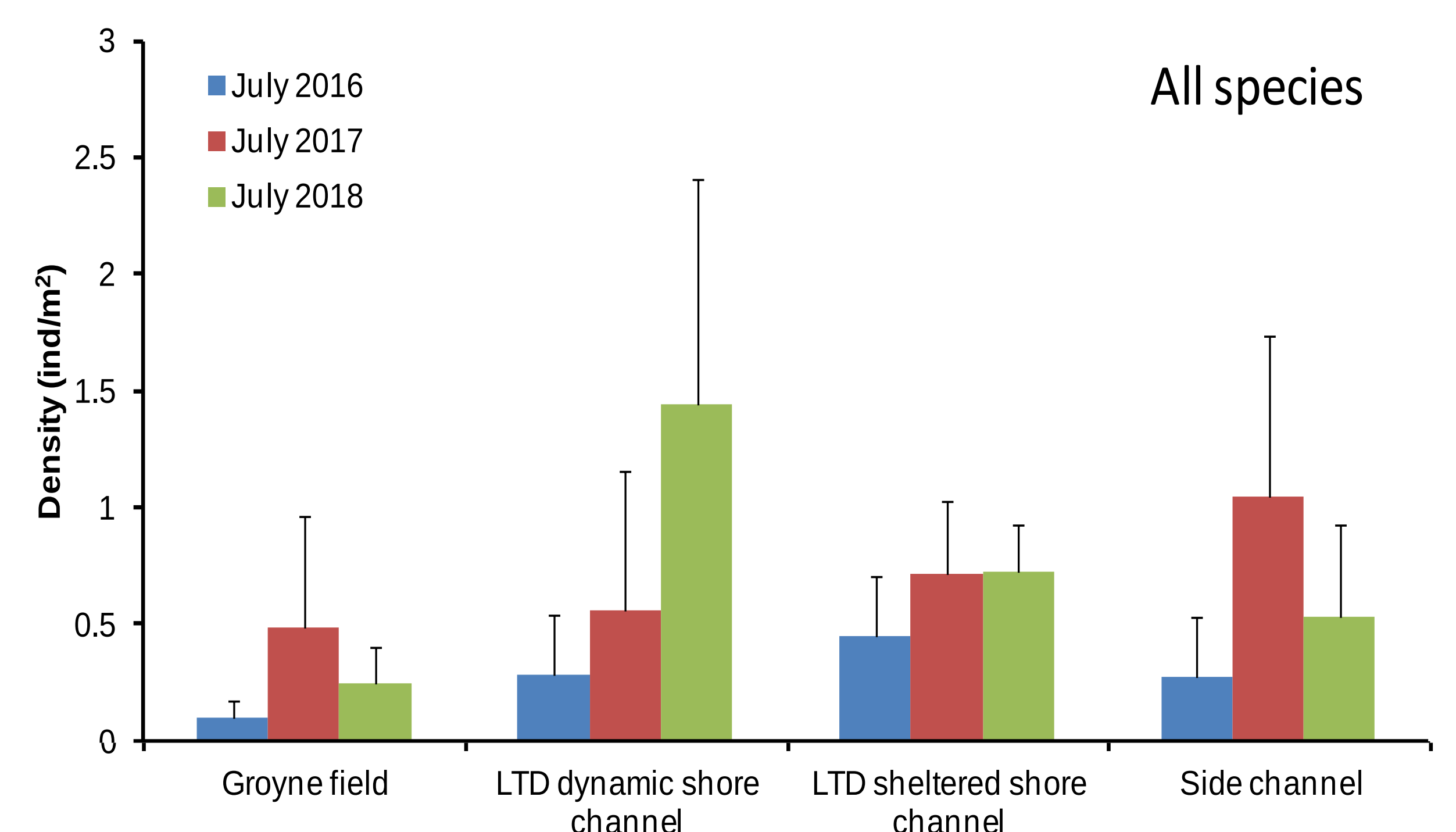


Figure 3: Densities of native and alien fish species in a reference groyne field and side channel compared to the shore channel

Interested?

Email to: f.collas@science.ru.nl
Explore more on 'the ecology of the longitudinal training dams' [project description](#)

