Supplementary material

Table S.1: data sets used for the development of the screening effect (SE) equation, Lmin is the minimal body length [mm], Lmax is the maximum body length [mm], wmax is the maximum body width [mm], va,min is the minimal approach flow velocity to the bar rack [m/s], va,max is the maximum approach flow velocity to the bar rack [m/s], s is the bar rack spacing [mm], θ is the inclination angle of the bar rack [°] and β is the horizontal angle of the bar rack [°]

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| LMin | LMax | va,min | va,max | s | θ | β | SE | Reference |
| 500 | 1100 | 0,50 | 1,20 | 20 | 63.4 | 90 | 0.54 | Calles et al. (2010) |
| 500 | 930 | 0,50 | 1,20 | 80 | 63.4 | 90 | 0 |  |
| 500 | 1000 | 0,60 | 1,30 | 40 | 77 | 90 | 0 | Calles et al. (2012) |
| 500 | 1000 | 0,60 | 1,30 | 90 | 60 | 90 | 0 |  |
| 510 | 1060 | 0,50 | 1,20 | 18 | 35 | 90 | 0.85 | Calles et al. (2013) |
| 550 | 570 | 0,30 | 0,30 | 25 | 90 | 45 | 0.65 | Dixon (2001) |
| 550 | 570 | 0,60 | 0,60 | 25 | 90 | 45 | 0.56 |  |
| 550 | 570 | 0,90 | 0,90 | 25 | 90 | 45 | 0.65 |  |
| 550 | 570 | 0,30 | 0,30 | 50 | 90 | 15 | 0.67 |  |
| 550 | 570 | 0,60 | 0,60 | 50 | 90 | 15 | 0.83 |  |
| 570 | 930 | - | - | 30 | 75 | 15 | 0.89 | Durif et al. (2002) |
| 640 | 920 | 0,10 | 0,65 | 58 | 55 | 90 | 0 | Piper et al. (2015) |
| 640 | 920 | 0,10 | 1,20 | 58 | 55 | 90 | 0 |  |
| 540 | 750 | 0,10 | 0,44 | 30 | 90 | 30 | 0.40 | Travade et al. (2010) |
| 500 | 900 | 0,10 | 0,44 | 30 | 90 | 30 | 0.46 |  |
| 620 | 1100 | 0,10 | 0,44 | 30 | 90 | 30 | 0.92 |  |

References

Calles O, Olsson IC, Comoglio C, Kemp PS, Blunden L, Schmitz M, Greenberg LA. 2010. APPLIED ISSUES Size-dependent mortality of migratory silver eels at a hydropower plant, and implications for escapement to the sea. Freshw. Biol. 55(10):2167–2180.

Calles O, Karlsson S, Hebrand M, Comoglio C. 2012. Evaluating technical improvements for downstream migrating diadromous fish at a hydroelectric plant. Ecol Eng. 48:30–37.

Calles O, Karlsson S, Vezza P, Comoglio C, Tielman J. 2013. Success of a low-sloping rack for improving downstream passage of silver eels at a hydroelectric plant, Freshw. Biol. 58(10):2168–2179.

Dixon, D. 2001. Evaluation of Angled Bar Racks and Louvers for Guiding Fish at Water Intakes. Report. Electric Power Research Institute (EPRI)

Durif CMF, Elie P, Gosset C, Rives J, Travade F. 2002. Behavioral Study of Downstream Migrating Eels by Radio-telemetry at a Small Hydroelectric Power Plant, paper presented at American Fisheries Society Symposium.

Piper AT, Manes C, Siniscalchi F, Marion A, Wright RM and Kemp PS. 2015. Response of seaward-migrating European eel (Anguilla anguilla) to manipulated flow fields, Proceedings of the Royal Society B: Biological Sciences. 282(1811):20151098.

Travade F, Larinier M, Subra S, Gomes P, de Oliveira E. 2010. Behaviour and passage of European silver eels (Anguilla anguilla) at a small hydropower plant during their downstream migration. Knowl Manag Aquat Ecosyst. 398:1.