Challenges in delivering weir removal projects:

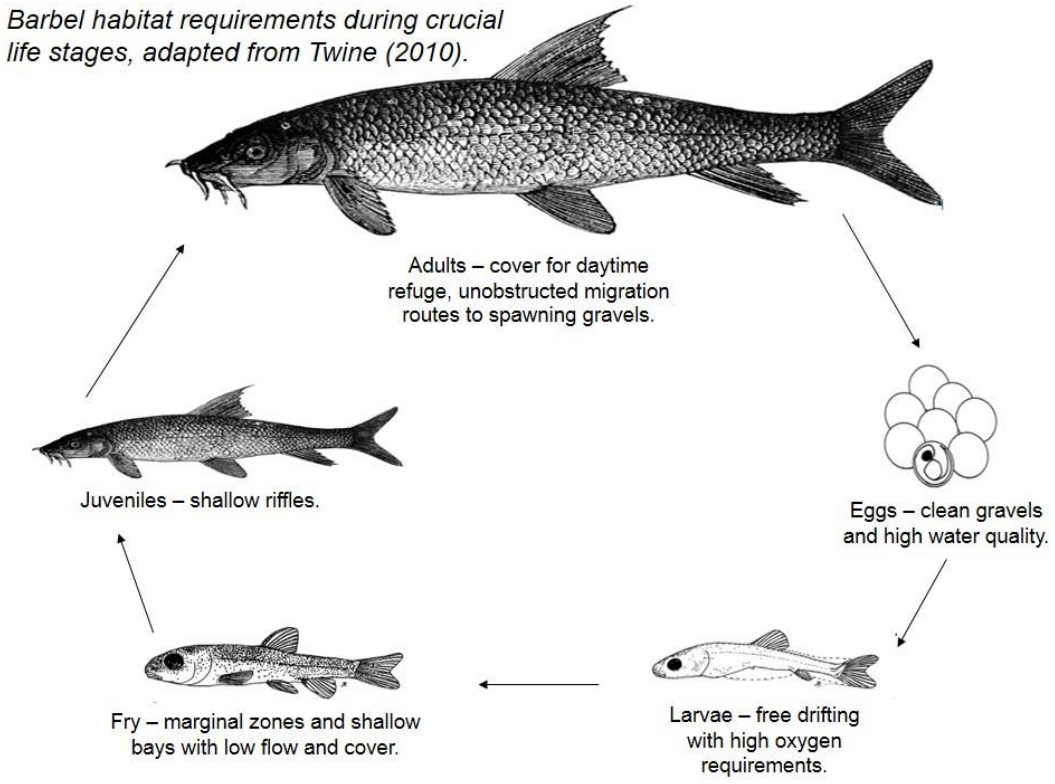
Attempting to gain stakeholder buy in and overcoming resistance to change…

Dr Chris Gardner, South East Rivers Trust.

How weirs affect fish communities

http://www.southeastriverstrust.org/how-weirs-affect-fish-communities/

1. Habitat fragmentation – barrier to fish migration/movement.



References:

- Fuller, M.R., Doyle, M.W. and Strayer, D.L. (2015) Causes and consequences of habitat fragmentation in river networks. *Annals of the New York Academy of Sciences* **1355**: 31-51.
- Junge, C., Museth, J., Hindar, K., Kraabøl, M. and Vøllestad, L. A. (2014) Assessing the consequences of habitat fragmentation for two migratory salmonid fishes. *Aquatic Conservation: Marine and Freshwater Ecosystems* **24**: 297–311.
- Kemp, P.S. & J.R. O'Hanley (2010) Procedures for evaluating and prioritising the removal of fish passage barriers: a synthesis. *Fisheries Management and Ecology* **17**: 297–322.

How weirs affect fish communities

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2. River habitat is degraded – impoundment.

Reference:

- Mueller, M. Pander, J. Geist, J. (2011) The effects of weirs on structural stream habitat and biological communities. *Journal of Applied Ecology* **48**: 1450-1461.
- Poulet N. (2007) Impact of weirs on fish communities in a piedmont stream. *River Research and Applications* **23**: 1038–1047.
- Birnie-Gauvin, K., Aarestrup, K., Riis, T.M.O., Jepsen, N., Koed, A. (2017) Shining a light on the loss of rheophilic fish habitat in lowland rivers as a forgotten consequence of barriers, and its implications for management. *Aquatic Conservation: Marine and Freshwater Ecosystems* **2017**: 1–5.
- Birnie-Gauvin, K., Larsen, M.H., Nielsen, J. & Aarestrup, K. (2017) 30 years of data reveal dramatic increase in abundance of brown trout following the removal of a small hydrodam. *Journal of Environmental Management* **204**, 467-471.

How weirs affect fish communities

http://www.southeastriverstrust.org/how-weirs-affect-fish-communities/

3. Sediment transport is halted – inhibits geomorphological function.

Reference:
- Downward S. & Skinner K. (2005) Working rivers: the geomorphological legacy of English freshwater mills. *Area*, **37**: 138–147.

Stakeholders can be highly resistant to change.

River Wandle - Butter Hill

– Before Partial Removal

After Partial Removal.

Reference:
- Lejon A.G.C., Malm Renöfält B. & Nilsson C. (2009) Conflicts associated with dam removal in Sweden. *Ecology and Society* **14(2)**: 4.

Case study 1 – River Darent, Kent.

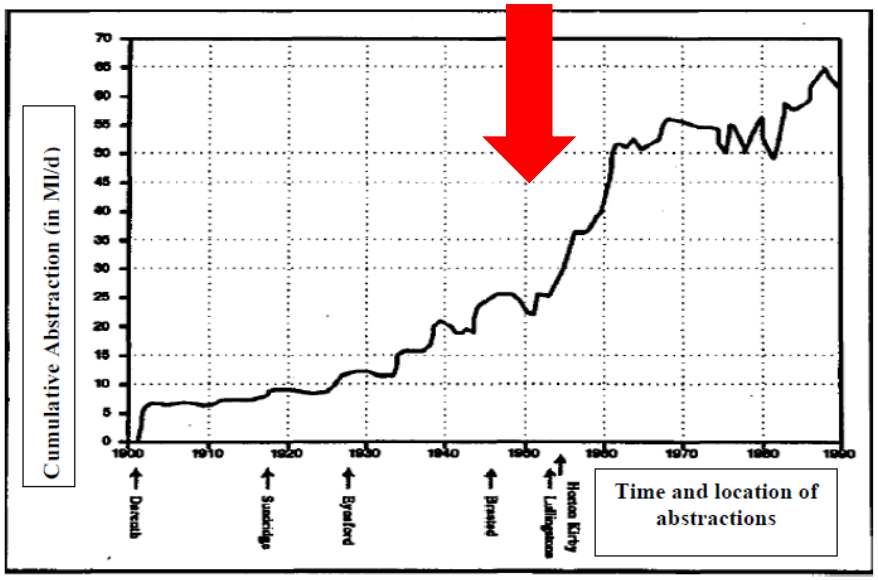


Figure 1a (from NRA 1994). Abstraction in the Darent catchment rose gently from initial abstractions at Darenth in 1902, until a major increase between 1950 and 1960 occurred at Lullingstone and Horton Kirby

Case study 1 – River Darent, Kent.

1976 - Eynesford

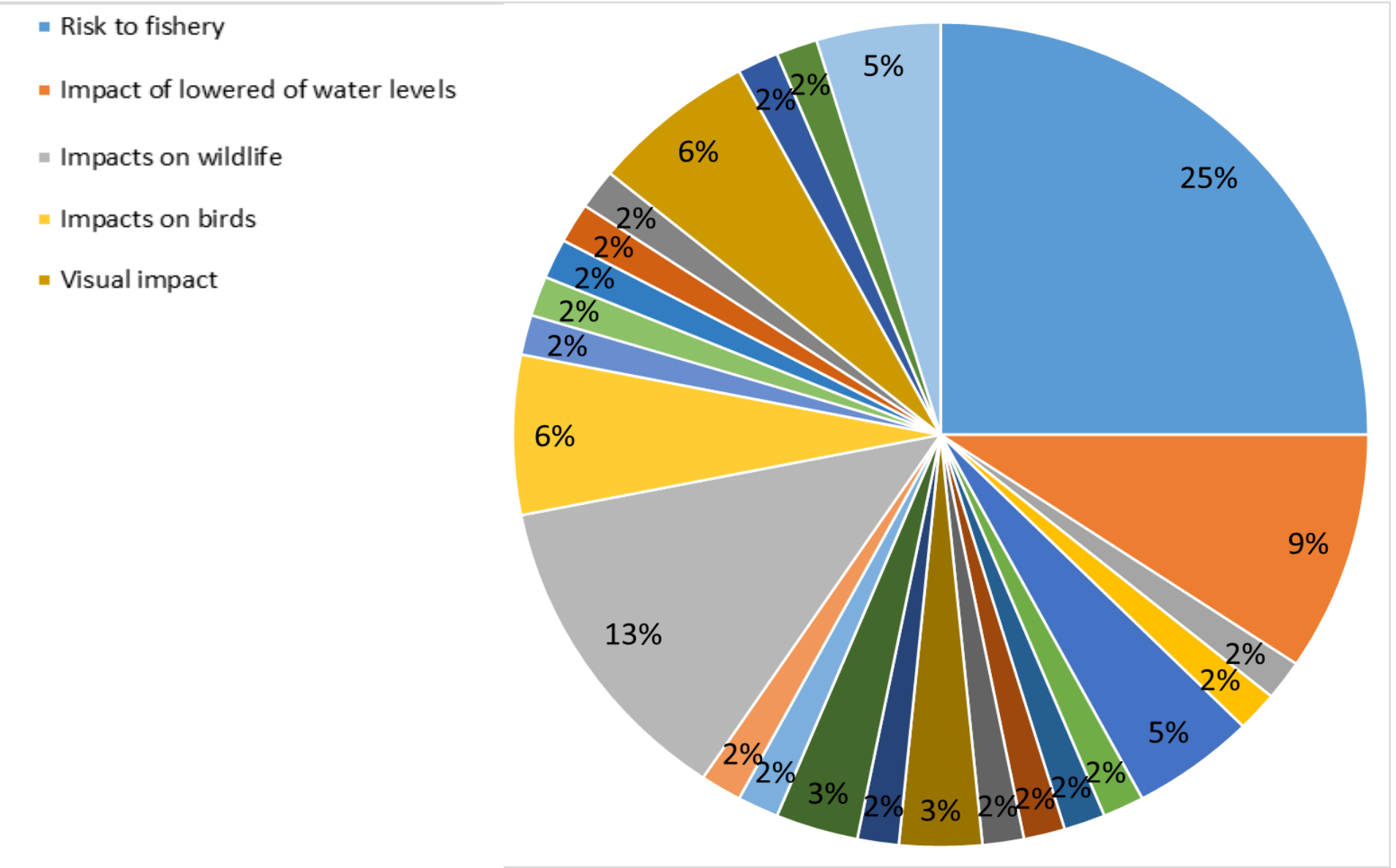
Case study 2 – Upper Medway, Kent.

Ashurst weir

Chafford lane tilting sluice

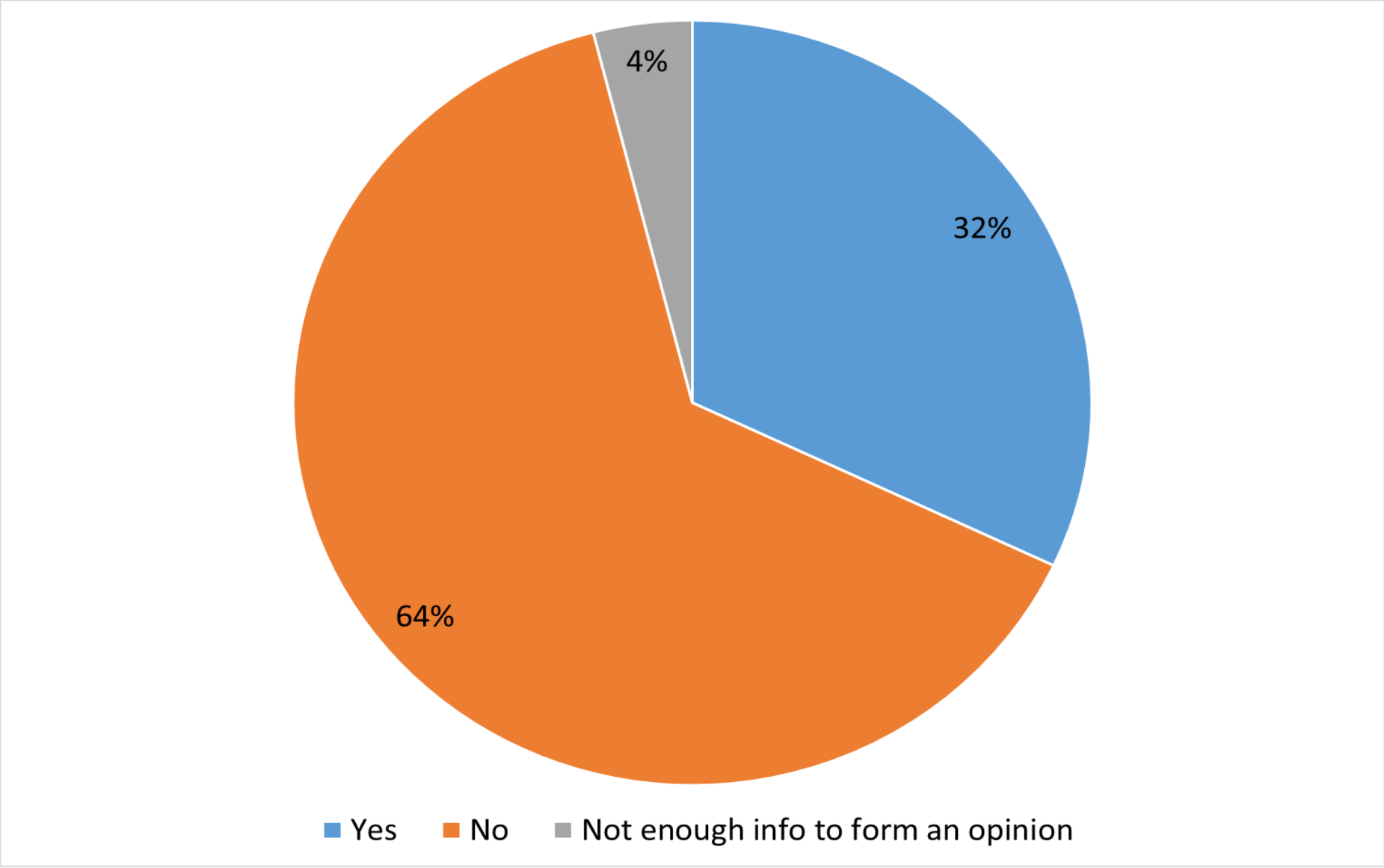
Case study 2 – Upper Medway, Kent.

Issues raised: if there were to be a change to the current arrangement of the sluice maintaining upstream water levels (n= 37).



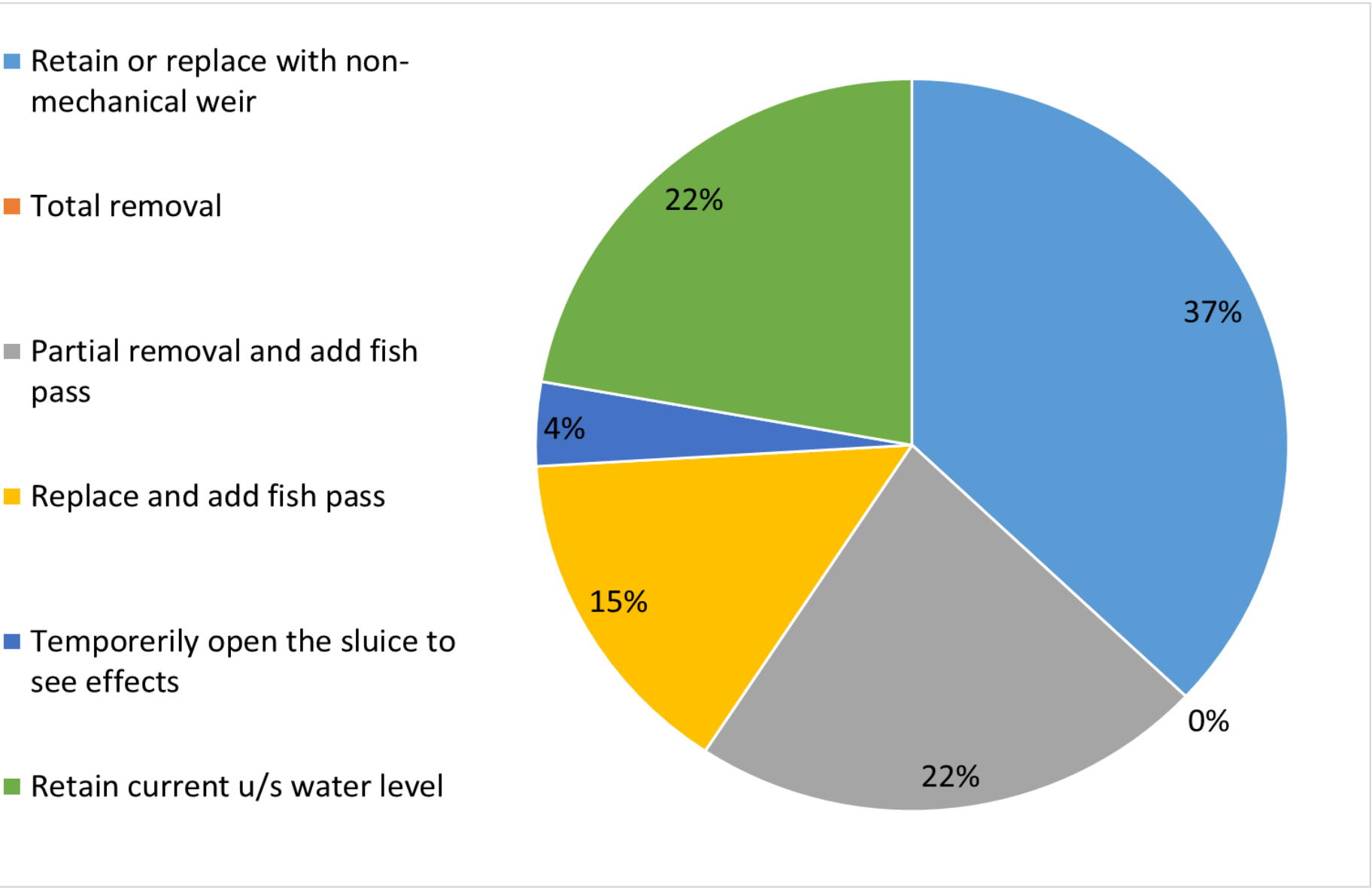
Case study 2 – Upper Medway, Kent.

Do you think the complete or partial removal of Chafford sluice are options which should be investigated when considering the future of the sluice? (n = 37).



Case study 2 – Upper Medway, Kent.

Any preference for a solution voiced throughout the feedback / information capture form? (n = 27).



Medway Consultation Summary.

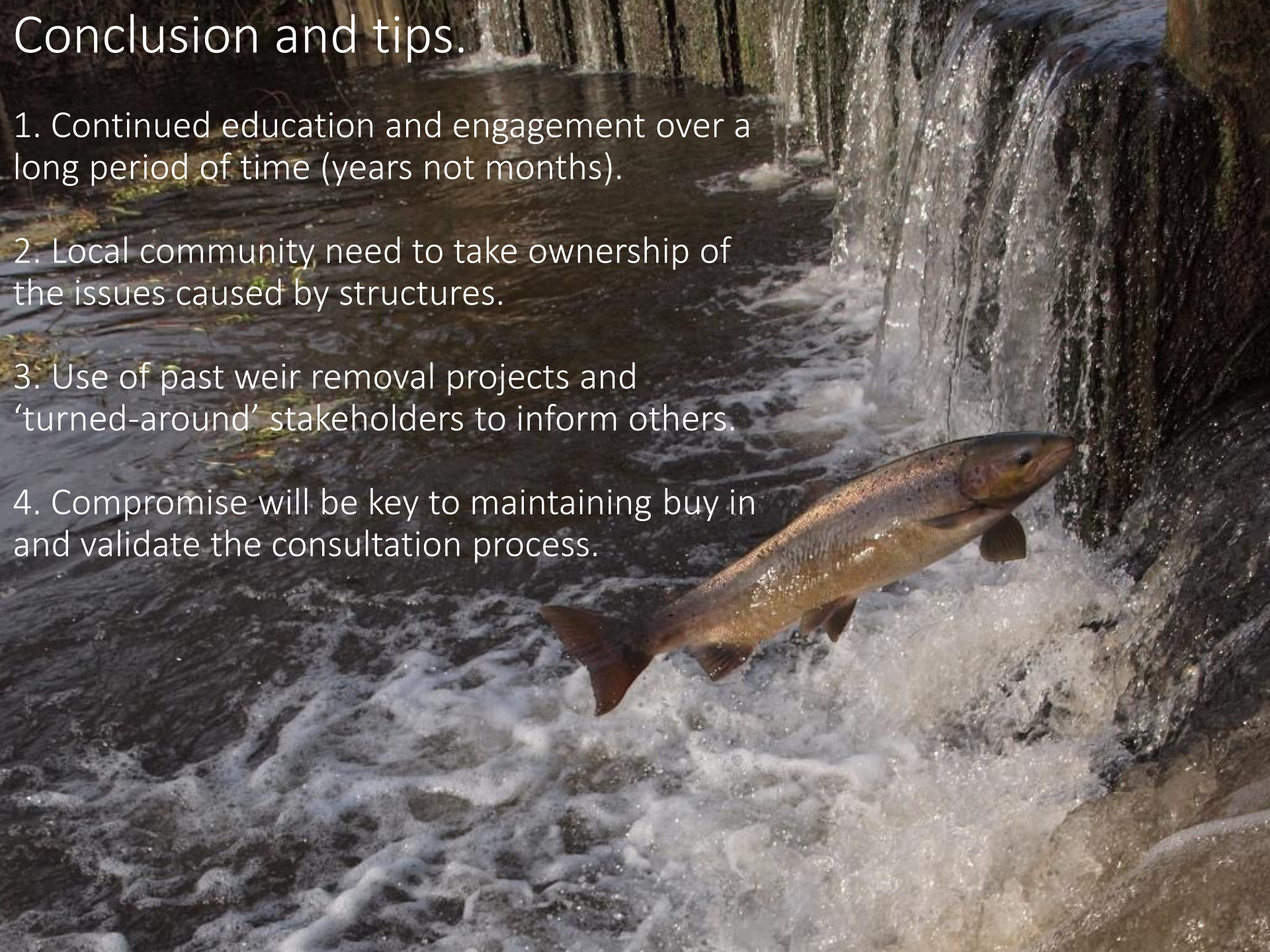
Conclusion and tips.

1. Continued education and engagement over a long period of time (years not months).

2. Local community need to take ownership of the issues caused by structures.

3. Use of past weir removal projects and ‘turned-around’ stakeholders to inform others.

4. Compromise will be key to maintaining buy in and validate the consultation process.



Conclusion and tips.

5. “*Patience you must have, my young Padawan*”. Yoda.