

3. Applied hydrology and development

There is an important synthesis and integrity between hydrology and ecology (as well as other earth sciences) and we have recognised the increasing importance of applying an understanding and interpretation of hydrological issues within ecology-led projects to assist our clients in a variety of situations and projects. Our in-house hydrologists are adept at integrating hydrological studies to meet ecological goals, as well as undertaking more traditional hydrological surveys and research.

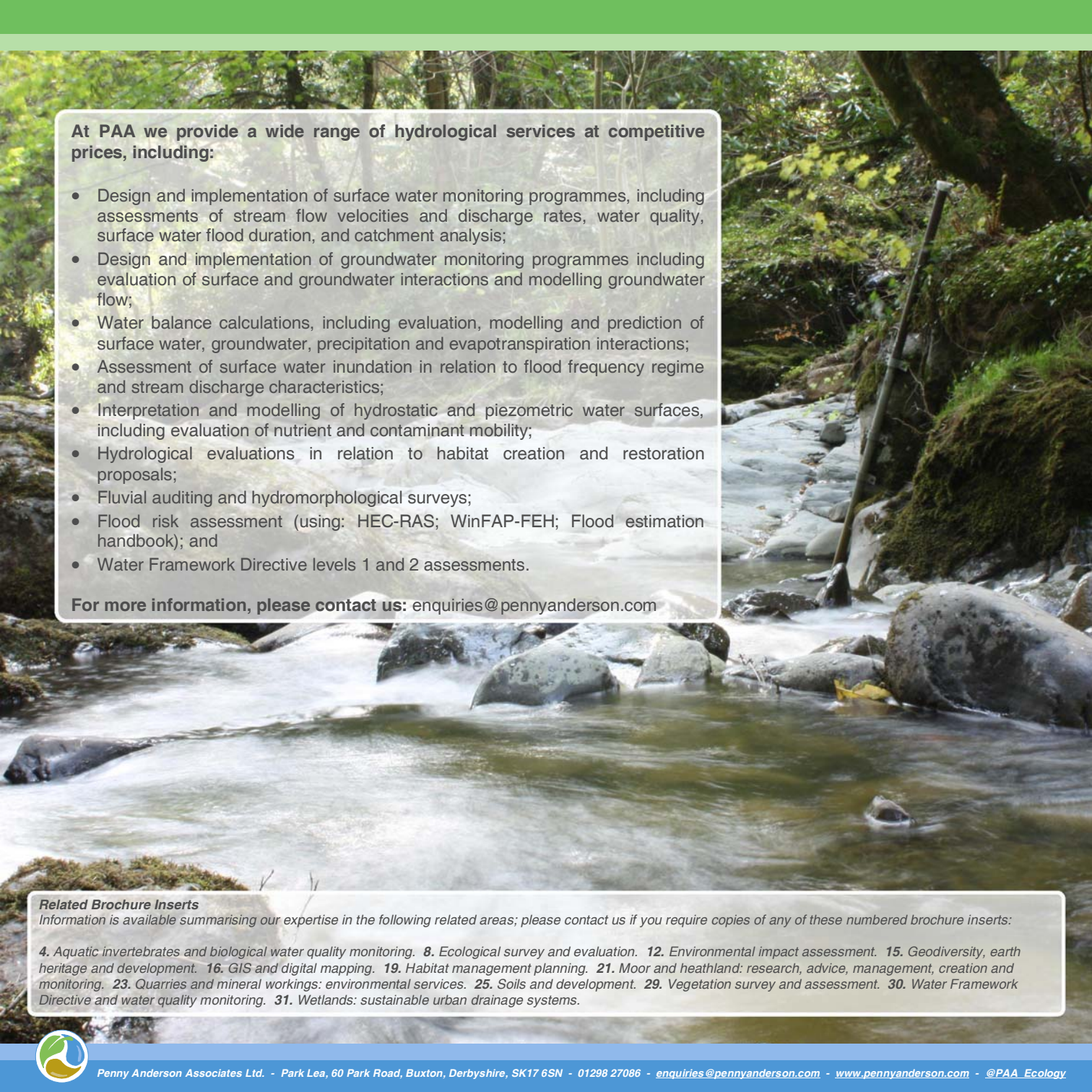
Solving Applied Hydrological Problems

Penny Anderson Associates Ltd. (PAA) always seeks to integrate best current scientific knowledge within a practical and achievable methodology. Based on our specialist hydrological skills and long-standing ecological experience, we have developed considerable expertise in project design and implementation, including initial scoping studies to assess the best approach to achieve the desired project goals. Over the years we have developed a significant portfolio of projects with a strong hydrological emphasis, including some long-term catchment monitoring and experimental projects. We have special expertise in upland and peatland environments.

A Multi-Disciplinary Team

Our work calls for a close collaboration between hydrology and other disciplines, primarily ecology but also geomorphology, and as such we are very used to working as part of a multi-disciplinary team and able to integrate our findings with those of associated scientists. We utilise our skilled and experienced in-house Geographic Information Systems (GIS) department to manipulate, process and test statistically hydrological data for trends and effects of interventions and to integrate the results of ecological field surveys (such as aquatic invertebrates).





At PAA we provide a wide range of hydrological services at competitive prices, including:

- Design and implementation of surface water monitoring programmes, including assessments of stream flow velocities and discharge rates, water quality, surface water flood duration, and catchment analysis;
- Design and implementation of groundwater monitoring programmes including evaluation of surface and groundwater interactions and modelling groundwater flow;
- Water balance calculations, including evaluation, modelling and prediction of surface water, groundwater, precipitation and evapotranspiration interactions;
- Assessment of surface water inundation in relation to flood frequency regime and stream discharge characteristics;
- Interpretation and modelling of hydrostatic and piezometric water surfaces, including evaluation of nutrient and contaminant mobility;
- Hydrological evaluations in relation to habitat creation and restoration proposals;
- Fluvial auditing and hydromorphological surveys;
- Flood risk assessment (using: HEC-RAS; WinFAP-FEH; Flood estimation handbook); and
- Water Framework Directive levels 1 and 2 assessments.

For more information, please contact us: enquiries@pennyanderson.com

Related Brochure Inserts

Information is available summarising our expertise in the following related areas; please contact us if you require copies of any of these numbered brochure inserts:

4. Aquatic invertebrates and biological water quality monitoring. **8.** Ecological survey and evaluation. **12.** Environmental impact assessment. **15.** Geodiversity, earth heritage and development. **16.** GIS and digital mapping. **19.** Habitat management planning. **21.** Moor and heathland: research, advice, management, creation and monitoring. **23.** Quarries and mineral workings: environmental services. **25.** Soils and development. **29.** Vegetation survey and assessment. **30.** Water Framework Directive and water quality monitoring. **31.** Wetlands: sustainable urban drainage systems.

