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CONSERVATION LTD



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ABOUT PISCES CONSERVATION

PISCES CONSERVATION was founded in 1995 by environmental science staff from the UK power industry and major British universities, and because of its unique combination of industrial and academic expertise, is now one of the leading consultancies in its field. Since its inception the PISCES philosophy has been to provide practical environmental know-how to our clients, coupled with an uncompromising commitment to quality and scientific rigour. This is recognised globally and our extensive international experience includes recent assignments in Peru, Brazil, Kazakhstan, Europe and the USA.

Consultancy

PISCES specialises in marine and aquatic habitats, although our consultants have considerable expertise in terrestrial ecosystems too. We pride ourselves on our speedy report production, and on providing our clients with comprehensive and accessible survey results and recommendations. We achieve this through a combination of dependable experience and the latest IT systems and software.



Piscès has considerable expertise in techniques for river management and habitat improvement.

Environmental Impact Assessment

EIA is one area where the strengths of PISCES come to the fore. Engineering and construction schemes require jargon-free environmental information and accurate prediction at the scoping and final assessment levels. PISCES is well equipped to undertake such tasks, with particular expertise in the evaluation and mitigation of the impact of power generation on the environment.



The ecological impact of power stations is a key area of expertise. Our wide experience is supported by unique databases and an extensive library of reports and grey literature.

Conservation

Conservation projects are invariably complex and multi-faceted, requiring the skills of a range of experienced specialists. PISCES has experts in invertebrate taxonomy, lake and river life, fish ecology, conservation biology, biodiversity monitoring and ecological methodology. They have worked on conservation projects ranging in size from the management of ephemeral fairy shrimp puddles to project planning for the largest floodplain reserve in the world, the Mamirauá reserve in the Amazon basin.

Our high reputation is underlined by our extensive and varied project record, and by a long list of scientific and expert publications from over thirty years of research. Members of our team have written books on aquatic ecology, taxonomy and ecological methodologies, and also regularly teach at Southampton, Oxford and other universities.

Piscès Conservation has particular expertise in the analysis of ecological and time series data. We regularly work on fish population dynamics and worked with Prof. Sir Richard Southwood on the long-term dynamics of British Heteroptera.

Software

Our computer software is developed in-house, giving us a clear advantage over many other consultancies in speed, accuracy, analytical insight and cost. Our ecological software packages are extensively used throughout the world, by industry, professional ecologists, museums and universities.

RECENT PROJECTS AND CLIENTS

Recent software releases include new versions of our *Community Analysis Package* and *Species Diversity and Richness*. We also continue to produce multi-media CDs and books, including *A Practical Handbook for Multivariate Methods*.

Our client list is extensive and includes:

PBPower
British Energy
TXU-Energy
Ministry of Defence
Environment Agency
Bristol Ports Authority
P&O/Shell
DB Ports London Gateway Project
Wessex Water
Southern Water
EDF
Riverkeeper
BBC
Ontario Waterkeeper
Charles Darwin Research Station, Galapagos



Invertebrate sampling, Salisbury Plain

Over the last five years, we have worked extensively in the USA, providing ecological advice and expertise on power station issues in the Hudson River Valley, the Great Lakes and California. In Europe, we have been involved with the EU 5th Framework MIDI-CHIP project, collaborating with scientists from Finland, the Czech Republic and Italy

In the UK, we have worked intensively on a wide range of power station projects ranging from small alternative power generation schemes to the largest nuclear projects. You can download a selection of our reports from our website: www.irchouse.demon.co.uk/latestreports.html

Pisces staff have worked in the Severn estuary and Bristol Channel for more than 30 years and we have recently completed 30 years of continuous monthly monitoring of fish and crustacean catches at Hinkley Point power station. This long-term commitment to the area means we have an extensive knowledge of the wildlife of the region, in particular the fish and crustaceans. We are presently working on an analysis of changes in the fish population linked to climate change. More information on this area of our work appears on our website at www.irchouse.demon.co.uk/consultproj1.html



Bass, Dicentrarchus labrax

Our staff regularly publish on the population dynamics of fish and crustaceans in the Bristol Channel. We have a particular interest in the impact of climate change. Recent papers include:

Henderson, P. A. & R. M. Seaby. (2005) The role of climate in determining the temporal variation in abundance, recruitment and growth of sole *Solea solea* (L) in the Bristol Channel. *J. Mar. Biol. Ass. UK.* **85** 197-204.

Henderson, P. A. Seaby, R. M. & Somes, J. R, 2006. A 25-year study of climatic and density-dependent population regulation of common shrimp, *Crangon crangon*, in the Bristol Channel. *J. Mar. Biol. Ass. UK.* **86**, 287-298.

Henderson, P. A. & Bird D. J., 2010. Fish and macrocrustacean communities and their dynamics in the Severn Estuary. *Marine Pollution Bulletin*, **61**, 100-114.

P.A. Henderson, R.M.H. Seaby, J.R. Somes (2011) Community level response to climate change: The long-term study of the fish and crustacean community of the Bristol Channel, *Journal of Experimental Marine Biology and Ecology*, DOI: 10.1016/j.jembe.2011.02.028.

KEY STAFF AND CONSULTANTS



Richard Seaby, BSc, PhD

Richard is the managing director of PISCES. He obtained his degree from the University of London, and doctorate in freshwater ecology from the University of Liverpool. He is a specialist in aquatic ecology and Windows programming for ecological applications. He has taken a major role in the development of our ecological software for biodiversity and community analysis. He is an expert on freshwater leeches and flatworms which he studied for his doctoral thesis. Much of his ecological work in recent years has been on the effect of industrial plant on marine and estuarine fisheries.



Peter Henderson, BSc, PhD

Piscis' second director, Peter obtained both bachelors and doctoral degrees from Imperial College, London. He has 30 years experience in applied ecological research, and lectures on population ecology and ecological methods at the University of Oxford. He co-authored with Sir Richard Southwood the third edition of the classic text book '*Ecological Methods*' and with Dr Martin Speight '*Marine Biology: Concepts and Applications*'. His taxonomic speciality is freshwater ostracoda and he wrote the Linnean Society Synopsis of British species. He is a specialist in population dynamics and tropical and temperate crustacean and fish ecology. Peter has worked extensively on the conservation of wetlands and is an experienced population modeller. He worked for many years on the creation of the Mamiraua reserve in the Brazilian Amazon and with Prof. W. D. Hamilton on the evolution of sex and community ecological theory. Since leaving university Peter has worked on the ecological effects of power stations and has been studying the fish and crustacean population dynamics in the Bristol Channel since 1980 using samples of animals impinged on cooling water intake screens. He has worked extensively as an expert witness both in Britain and the USA. He is a Senior Research Associate at the University of Oxford and a visiting Research Fellow at Southampton University.



Robin Somes

Robin originally trained as a scientific illustrator but has subsequently worked for many years in ecological consultancy, particularly relating to the power industry and water abstraction. At the PISCES office, he maintains the company websites and software help systems, deals with software sales and advertising, report production, and creates the compa-

ny's multimedia CDs. In the field he works on fish, invertebrate and plant surveys on rivers and water intakes. He is highly experienced in electric fishing and boat work, and has a particular interest in botany. He is one of our most experienced fish taxonomists.



Natalie Swan BSc

Natalie studied for her first degree at the University of Kent where she acquired an interest in tropical freshwater ecology and caiman in particular. She works for PISCES on fish and fisheries studies at power stations. Her main focus is the impingement of fish on cooling water intakes. She has maintained her interest in the Amazon and continues to work in Peru during the summer. Natalie is presently working on a new edition of the PISCES multimedia CD on the fishes of the Amazon and their habitats.



Claire Henderson, BSc, PhD

Claire obtained her Bachelors and Doctoral degrees from Imperial and Queen Elizabeth Colleges, London. She specialised in insect energetics and for her doctoral studies worked on aphids; at PISCES she works mainly on benthic and plankton ecology and the production of e-books. Claire also helps to run the office and works on report preparation and data analysis.



Mr Mark Cox and Mr Mick Crummack working with Natalie Swan on fish impingement

As well as our full-time staff, we have a strong team of part-timers who assist with our fieldwork, as well as maintenance and other routine tasks. In total, we have a team of 12 trained and experienced staff who could be deployed to work anywhere in the UK at short notice. All of the team are security-vetted for working on UK licensed nuclear sites, and hold a range of other inductions for safe working on industrial sites.

LIST OF PISCES STAFF PUBLICATIONS

Books

- Henderson, P. A. and Seaby R. M. (2008) *A Practical Handbook for Multivariate Methods*. Pisces Conservation Ltd., 223pp.
- Speight, M & Henderson, P.A. (2010) *Marine Biology: Concepts and Applications*. Wiley-Blackwell, 256 pp.
- Henderson, P.A. (2002). *Practical Methods in Ecology*. Blackwell Scientific (in press).
- Henderson, P. A. & Southwood, T. R. E. (2000). *Ecological Methods*. 3rd Edition. Blackwell Scientific. 590 pp
- Henderson, P.A. (1990) Freshwater ostracods. *Synopsis of the British Fauna (New Series) No. 42*. Universal Book Services, Oegstgeest, Netherlands.

Articles

- Henderson, P. A. & Seaby, R. M. H. (1994) *On the factors influencing juvenile flat fish abundance in the lower Severn Estuary*. *Neth. J. Sea Res.* **33**; 321-330.
- Henderson P. A. & Hamilton W.D. (1995) *Standing crop and distribution of fish in drifting and attached floating meadow within an Upper Amazonian varzea lake*. *J. Fish Biol.* **47**, 266-276.
- Henderson, P. A. Irving, P. W. & Magurran, A. E. (1997) *Fish pheromones and evolutionary enigmas: a reply to Smith*. *Proc. R. Soc. Lond. B.*, **264**, 451-453.
- Henderson, P. A. & Corps, M. (1997) *The role of temperature and cannibalism in interannual recruitment variation of bass in British waters*. *J. Fish Biol.* **50**, 280-295.
- Henderson, P. A. , Hamilton, W. D. & Crampton, W. G. R. (1998) *Evolution and diversity in the Amazonian floodplain communities*. *Dynamics of tropical communities*, Newbury, D. M., Prins, H. H. T. & Brown, N. D. (eds) *The 37th British Ecological Society*. 385-419.
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- Henderson, P. A. & Seaby, R. M. H. (1999) *Population stability of the sea snail at the southern edge of its range*. *J. Fish Biol.* **54**, 1161-1176.
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- Henderson, P. A. (1999) *Stepping back from the brink: estuarine communities and their prospects*. *Brit. Wildlife* **11**, 85-90.
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- Pickett G. D., Eaton D. R., Seaby R. M. H. & Arnold G. P., (1994) *Results of bass tagging in Poole Bay during 1992*. MAFF Laboratory leaflet No. 74; 12pp.
- Seaby R. M. H., Martin A. J. & Young J. O., (1995) *The reaction time of leeches and triclads to crushed prey and the significance of this for their coexistence in British lakes*. *Freshwater Biology* **43**: 21-28
- Seaby R. M. H., Martin A. J. & Young J. O., (1996) *Food partitioning by lake-dwelling triclads and glossiphoniid leeches: field and laboratory experiments*. *Oecologia* **106**: 544-550
- Young J. O., Seaby R. M. H. & Martin A. J., (1995) *Contrasting mortality in young fresh water leeches and triclads*. *Oecologia* **101**; 317-323.
- T. R. E. Southwood, P. A. Henderson & I. P. Woiwod (2003) *Stability and change over 67 years – the community of Heteroptera as caught in a light trap at Rothamsted, UK*. *Eur. J. Entomol.* **100**, 557-561
- Magurran, A. & Henderson, P. A. (2003) *Explaining the excess of rare species in natural species abundance distributions*. *Nature*, **422**, 714-716.
- M. J. Genner, D. W. Sims, V. J. Wearmouth, E. J. Southall, A. J. Southward, P. A. Henderson, S. J. Hawkins (2004) *Regional climatic warming drives long-term community changes of British marine fish* *Proc. R. Soc. Lond. B.* **271**, 655 – 661.
- Kirby, R., Henderson, P. A. & Warwick, R. M. (2004) *The Severn, UK; Why is the estuary different?* *Journal of Marine Science and Environment, Part C No. C2*. 3-17.
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- Henderson, P. A. Seaby, R. M. & Somes, J. R, 2006. *A 25-year study of climatic and density-dependent population regulation of common shrimp, Crangon crangon, in the Bristol Channel*. *J. Mar. Biol. Ass. UK.* **86**, 287-298.
- Henderson, P. A. 2007, *Discrete and continuous change in the fish community of the Bristol Channel in response to climate change*. *J. Mar. Biol. Ass. UK.* **87**, 589-598.
- Henderson, P. A. 2008, *Population Dynamics, Stability*. 3334- 3340. Sven Erik Jorgensen & Brian D. Fath, Eds. *Encyclopaedia of Ecology*, 1st Edition, Elsevier B.V., Oxford.
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- Henderson, P. A. & Bird D. J., 2010. *Fish and macro-crustacean communities and their dynamics in the Severn Estuary*. *Marine Pollution Bulletin*, **61**, 100-114.
- Henderson, P. A., 2010. *Fouling and Antifouling in Other Industries – Power Stations, Desalination Plants – Drinking Water Supplies and Sensors*. *Biofouling*. Wiley Blackwell 429pp. Ed. S. Durr and J. C. Thomason.
- Henderson, P.A., Seaby, R.M.H., and Somes, J.R. (2011) *Community level response to climate change: The long-term study of the fish and crustacean community of the Bristol Channel*. *Journal of Experimental Marine Biology and Ecology*, DOI: 10.1016/j.jembe.2011.02.028.

PISCES SOFTWARE TITLES AND TEACHING

As working ecologists, we understand the needs of users for reliable, versatile and easy-to-use software as an aid to research. Our programs are used in over 80 countries throughout the world; our clients include many leading universities and museums in Britain, the USA, Canada and Australia.

We also produce purpose-built programs for industry and research and would be glad to discuss your particular data handling, modelling or analysis requirements. For example, for the Butterfly Conservation Trust we developed an integrated suite of programs for collecting and analysing butterfly data. Individual recorders save results of butterfly surveys, which are collated and sent to regional recorders and the head office where our software can undertake a more sophisticated analysis. Recently, we also developed an ecological teaching package for the Ministry of Defence, which simulates the spread of radionuclides through the environment and food chain.

Most of our programs are developed using Delphi, but we will also use a number of other languages and database programs. For example, we have developed database applications using Access. Many of our programs allow the user to create simulated data. This feature is invaluable to aid researchers and students to understand the strengths and weaknesses of analytical methods and estimate accuracy. Please contact us if you have specialist simulation or modelling requirements.

Here, we list our most popular programs:

Fuzzy Grouping

Fuzzy clustering methods for handling imprecise data; using Fuzzy Ordination and Fuzzy C-means to determine likelihood of group membership.

Species Diversity and Richness IV

This is one of our most well-established programs which is in use throughout the world. It is used by both zoologists and botanists who wish to calculate or measure biodiversity.

Ecom

Analytical techniques to detect, visualise and order relationships from both species data and environmental variables. Principal methods: Canonical Correspondence Analysis (CCA), Redundancy Analysis (RDA) and Multiple Regression (MR).

Community Analysis Package

This has become our most successful program. It offers a range of methods for the analysis of animal and plant communities. Like Species Diversity and Richness, it is under continual development as we seek to improve and extend the features we offer.

Simply Growth and Simply Probit

These are two programs which offer specialist applications within a simple-to-use environment. Growth fits and plots von Bertalanffy, Gompertz and Logistic growth curves to length and/or weight at age data, while Probit performs lethal dose and growth analyses for toxicity data.

Simply Tagging

For estimating population size of both closed and open populations with mark-recapture methods. Includes data simulation options to model experiments for open and closed populations.

Density from Distance

With a range of analytical techniques used by ecologists to estimate animal and plant density from measurements of the distance between objects or from a selected line or point to the objects.

Removal Sampling

calculates population statistics from removal trapping data. Using maximum likelihood methods it calculates a population estimate, upper and lower 95 % confidence intervals and probability of fit.

Dynamica II

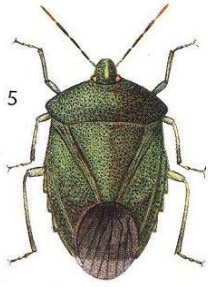
Using our extensive data on the abundance of fish and crustaceans in the Bristol Channel we have created a CD which allows students to explore the population dynamics of an estuarine community.

Teaching statistical methods

In addition to selling software, we also run one-day courses on methods of multivariate statistical analysis and the use of our programs to explore and interpret biological data. These popular courses are held approximately every 3 months. For more details, see <http://www.irchouse.demon.co.uk/1-train.html>

MULTIMEDIA CDs AND WEBSITES

Pisces CDs

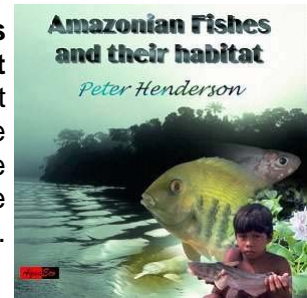


Land and Water Bugs of the British Isles

Southwood and Leston's classic text, 'Land and Water Bugs of the British Isles', now released in electronic form.

Amazonian Fishes and their Habitat

One of the most complete reference works about the region; a remarkable insight into Amazonia.



European Orchids

Contains over 80 images of the Orchidaceae of Britain and Europe.

Water And Man

Over 240 images of the aquatic environment, its inhabitants, and man's interaction with it.

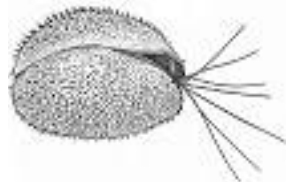


The Fish of Mamiraua

Photographs and background information on the fish of the Mamiraua Ecological Station, Brazil.

Freshwater Ostracods

Peter Henderson's standard guide for the identification of British ostracods: now on CD.



The Naturalist on the River Amazons

Henry Walter Bates's classic account of exploration and discovery in Amazonia.

British Water Beetles

All 3 volumes of Prof. Frank Balfour-Browne's classic Ray Society work on the British aquatic coleoptera — on one CD



Websites

Pisces consultancy and information - www.irchouse.demon.co.uk

- Reports and features on long-running and latest projects; information on staff and publications
- Books and other special offers
- Photo galleries and other resources of information; links to other sites

Pisces Conservation software - www.pisces-conservation.com

- Information and specifications for all our software titles
- Technical support, and free downloads

Power Station Effects - www.powerstationeffects.co.uk

- A searchable database of Pisces's collection of reports and grey literature
- Reprint service

Amazonian Fish and their Habitats - www.amazonian-fish.co.uk

- The companion site to our Amazonian Fish CD title

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Contact individual staff:

Richard Seaby

For programming inquiries, quotations and tenders, invertebrate & mollusc surveying, advice on fisheries issues, electric fishing.

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Peter Henderson

Impingement/entrainment, heated/saline discharge and other power station issues; benthic sampling, Severn estuary fish population trends, Amazonia; population modelling, statistical and ecological methods, expert witness work.

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Robin Somes

For botanical surveying, software sales and inquiries, technical support, licences, report reprints, advertising and website-related queries.

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HOW TO FIND US

