# Postdoctoral Fellowship – CSOF4

Role summary for potential applicants

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| Advertised Job Title**:** | Future Science Platform, Postdoctoral fellowship – Future Environmental DNA |
| Reference Number**:** | 54801 |
| Classification**:** | CSOF4 |
| Salary Range: | AU $83,487 to AU $91,451 plus up to 15.4% superannuation |
| Location**:** | IOMRC Crawley, Perth, WA |
| Tenure: | Specified Term of 3 years |
| Relocation assistance**:** | Will be provided to the successful candidate if required |
| Applications are open to: | * All Candidates |
| Functional Area**:** | Research Scientist / Engineer – Postdoc |
| % Client Focus - Internal: | 100% |
| % Client Focus - External: | 0% |
| Reports to the: | Project Leader |
| Number of Direct Reports: | 0 |

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| **Role Overview:** |
| [Future Science Platforms](http://www.csiro.au/en/About/Future-Science-Platforms) are an investment in science that underpins innovation and that has the potential to help reinvent and create new industries for Australia. FSPs will see us grow the capability of new generation of researchers and allow Australia to attract the best students and experts to work with us on future science. They are strategic investments aimed at developing capacity in areas of identified future importance for Australia. FSPs are both impact and science focused, developing innovative scientific solutions with industry, government and university partners. They support world class, coherent and creative research teams which integrate science and delivery over the long term, looking to the future science needs of CSIRO and our partners with a 5 to 10 year vision.  [The Environomics Future Science Platform](http://www.csiro.au/en/Research/Collections/Environomics). Environomics is genomics for environmental science, a frontier science that brings together advances in DNA sequencing, evolutionary biology, big-data and environmental modelling. Just as genomics has revolutionised agriculture and medicine, Environomics will shift Australia towards a whole-of-environment understanding of the genetic roots and relationships of our biodiversity, from our evolutionary hotspots, to the trillions of microbes essential to our soils, to the genes that give plants drought tolerance. Environomics will allow us to see beyond the Australian landscape to the genescape, transforming our ability to manage our biodiversity and make use of the genetic resources locked inside.  **The Project:** Future Environmental DNA - eCells: Developing novel ways to estimate animal abundance  Animal abundance is a fundamental aspect of population biology relevant to many fields from wildlife conservation to fisheries management. Because abundance is often difficult to estimate accurately via direct observation or tagging, concerted effort has been spent developing alternative methods. Genetic tools have featured prominently in this, and include estimates of genetic effective population size (e.g. Waples 1989), non-invasive mark-recapture (e.g. Berry et al 2012), and close-kin mark recapture methods (Bravington et al. 2016). The latter two methods rely on repeatedly sampling individuals in populations and produce more accurate estimates of abundance than genetic effective population size. However, they require expensive labour-intense fieldwork and may present ethical issues when sampling endangered species.  An alternative method for obtaining a sample of multiple individual genotypes is to sample their cells that have been shed into environmental samples. Aquatic samples contain the shed cells of many animals that live in the water body. Sorting these cells to separate cells from a single species of interest can be done with sorting fluorescent flow cytometers (Shapiro & Shapiro 2003). Firstly, Fluorescent DNA tags can be used to select cells only from the species of interest and to sort them from all other eCells present in the sample. Genotypes from individual cells can then be generated using PCR-based methods (e.g. Wang et al., 2012). All of the technologies to implement this procedure exist and are proven already, but this combination of them has not been explored yet.  **The Position** The Postdoctoral Fellow will be appointed for three years and will work within the Environomics Future Science Platform to undertake important developmental work in this exciting frontier of applied science. In this role you will work closely with Research Scientists to carry out innovative, impactful research of strategic importance to CSIRO. You will contribute to the project, Future Environmental DNA - eCells: Developing novel ways to estimate animal abundance, and will present your findings in appropriate publications and at conferences. |

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| **Duties and Key Result Areas:** |
| * Under the direction of senior research scientists, carry out innovative, impactful research of strategic importance to CSIRO to develop novel ways to estimate animal abundance that will, where possible, lead to important scientific outcomes. * Other duties specific to this role as directed by supervisors * Communication of results through the production of reports and scientific papers and contributions to appropriate scientific conferences. * Produce high quality scientific and/or engineering papers suitable for publication in quality journals, for client reports and granting of patents. * Contribute to the development of innovative concepts and ideas for further research. * Make a contribution to the effective functioning of the research team and help deliver CSIRO’s organisational objectives and plans. * Work collaboratively with colleagues within your team, the business unit and across CSIRO. * Communicate effectively and respectfully with all staff, clients and suppliers in the interests of good business practice, collaboration and enhancement of CSIRO’s reputation. * Adhere to the spirit and practice of CSIRO’s Values, Health, Safety and Environment plans and policies, Diversity initiatives and Zero Harm goals. * Undertake an appropriate training and development program developed by CSIRO. * Other duties as directed.   ***CSIRO’s postdoctoral training program***is developed between the Postdoctoral Fellow and a CSIRO scientist. The program will focus on enhancing the Fellows’ capabilities to the level expected of an independent researcher and will include on-the-job and course-based development encompassing:   * Discipline-specific techniques and protocols * Professional growth * Project management * Communication and influencing skills * Working and collaborating with others   <http://www.csiro.au/en/Careers/Student-and-graduate-programs/Postdoctoral-fellowships> |

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| **Selection Criteria:** |
| *Under CSIRO policy only those who meet all essential criteria can be appointed.*  *Please ensure that selection criteria are addressed in your application or it will not be considered.*  ***Pre-Requisites:***   * **Education/Qualifications:** A doctorate (or will shortly satisfy the requirements of a PhD) in a relevant discipline area, such as molecular biology, cell biology or molecular ecology.   ***Please note:*** *To be eligible for this role you must have* ***no more than 3 years (or part time equivalent)*** *of relevant postdoctoral experience.*   * **Communication: High level written and oral presentation skills and a capability for effective personal interactions that will promote the research, with the ability to represent the research team effectively internally and externally, and at national and international conferences.** * **Publications: A record of publications in quality, peer reviewed journals.** * **Behaviours:** A history of professional and respectful behaviours and attitudes in a collaborative environment.   ***Essential Criteria:***   1. Demonstrated ability to design and implement novel cell and/or molecular biological laboratory procedures. 2. Demonstrated ability to analyse complex molecular biological, population biological or ecological data sets. 3. **The ability to work effectively as part of a multi-disciplinary, regionally dispersed research team, as well as the ability to work independently without supervision.** 4. A record of innovation and creativity in self-directed research. 5. Demonstrated capacity to incorporate novel ideas into a project with goals determined by others.   ***Desirable Criteria:***   1. Demonstrated theoretical and/or practical knowledge of fluorescence activated cell sorting (FACS) technology. 2. Demonstrated theoretical and/or practical knowledge of single-cell genotyping. 3. Skill in software development of software tools for scientific data analysis in R or Python. 4. Experience with and a demonstrated interest in marine animal ecology.   **As Australia’s Innovation Catalyst, CSIRO has strategic actions underpinned by behaviours aligned to**:   1. Excellent science 2. Inclusion, trust & respect 3. Health, safety & environment 4. Delivery on commitments.   **In your application and at interview you will need to demonstrate alignment with these behaviours.**  To be appointed as a Postdoctoral Fellow within CSIRO, candidates are required to have **submitted** their PhD at the time of commencement, as a minimum requirement, if PhD conferment has not been obtained. If a candidate has submitted, but their PhD has not yet been formally attained, the starting salary will be CSOF4-1 ($80,833). Upon CSIRO receiving written confirmation that the PhD has been awarded (within a six month period from commencement date), the salary will be increased to the negotiated level and the difference will be back-paid to the Officer’s start date.  **Other special requirements:**  Appointment to this role may be subject to conditions including security/medical/character clearance requirements. Applicants who are not Australian Citizens or Permanent Residents may be required to undergo additional security clearance processes; which may include medical examinations and an international standardised test of English language proficiency (i.e. IELTS test). <http://www.ielts.org/default.aspx> |

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| **Other Information:** |
| **How to Apply:**  To apply for this position you will need to upload **one document only** containing your cover letter addressing selection criteria defined in this document, and CV/resume that best demonstrates your ability to meet the requirements of the role. Please take the time to provide relevant succinct answers. You may also need to respond to some screening questions on-line. Applicants who do not provide the information when requested will not be considered.  If you experience difficulties applying online call 1300 984 220 for assistance. Outside Australian business hours please email: [csiro-careers@csiro.au](mailto:csiro-careers@csiro.au).  **Referees**: Please provide contact details of two previous supervisor or academic/professional referees in your resume/CV. We will ask your permission before making contact.  **Contact:** If after reading the selection documentation you require further information please contact:  Simon Jarman via email: [simon.jarman@gmail.com](mailto:simon.jarman@gmail.com) or Oliver Berry email: [Oliver.Berry@csiro.au](mailto:Oliver.Berry@csiro.au)  Please do not email your application directly to Associate Professor Jarman or Dr Berry. Applications received via this method will not be considered.  **About CSIRO**  Australia is founding its future on science and innovation. Its national science agency, the Commonwealth Scientific and Industrial Research Organisation (CSIRO) is a powerhouse of ideas, technologies and skills for building prosperity, growth, health and sustainability. It serves governments, industries, business and communities across the nation.  Find out more! [www.csiro.au](http://www.csiro.au).  The Environomics FSP is a diverse yet cohesive and collaborative team of scientists whose shared goal is invent the tools that will enable next-generation environmental science and management. You can find out more here: <https://research.csiro.au/environomics/>  **About The National Research Collections of Australia:** CSIRO is the custodian of a number of collections of animal and plant specimens that contribute to national and international biological knowledge. Together, they constitute a vast storehouse of information about Australia’s biodiversity and underpin a significant part of the country’s taxonomic, genetic, agricultural and ecological research - making these vital resources for conservation and the development of sustainable land and marine management systems. Find out more! <https://www.csiro.au/en/Research/Collections>  **Relevant Research Publications:**  Berry O, Algar D, Angus J, et al. (2012) Genetic tagging reveals a significant impact of poison baiting on an invasive species. The Journal of Wildlife Management 76, 729-739.  Bravington, M. V., Skaug, H. J., & Anderson, E. C. (2016). Close-kin mark-recapture. Statistical Science, 31(2), 259-274.  Shapiro, H. M., & Shapiro, H. M. (2003). Practical flow cytometry.  Wang, J., Fan, H. C., Behr, B., & Quake, S. R. (2012). Genome-wide single-cell analysis of recombination activity and de novo mutation rates in human sperm. Cell, 150(2), 402-412.  Waples, R. S. (1989). A generalized approach for estimating effective population size from temporal changes in allele frequency. Genetics, 121(2), 379-391. |