



Centre for  
Biodiversity  
Analysis



# Centre for Biodiversity Analysis 2020-21 Annual Report

October 2021

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Established in 2012, the CBA is a joint initiative of ANU, CSIRO and University of Canberra whose mission is through collaborative science and training, with a focus on cutting-edge applications of genomics and spatial environmental analysis, to improve the understanding, protection and resilience of Australia's unique biodiversity and ecosystems in the face of accelerating environmental change.

The CBA's key aims are:

- To promote collaborative biodiversity science across ANU, UC and CSIRO that will develop and demonstrate novel approaches to biodiversity discovery, understanding and analysis;
- To build capacity through training of graduate and postdoctoral scholars; and
- To incorporate new knowledge on Australia's biodiversity into Commonwealth and State-level conservation policy and management.

These aims are achieved by:

- Supporting projects co-proposed by ANU, UC and CSIRO research scientists, postdoctoral fellows and PhD students;
- Supporting and coordinating external visitors and CBA members to present training workshops, seminars symposia and conferences;
- Supporting training and access to new genomic technologies via the Ecogenomics and Bioinformatics Lab (EBL);
- Supporting co-supervised students; and
- Supporting the exchange of scientific and policy knowledge, perspectives and challenges amongst researchers, policy makers and managers.

With restrictions continuing to limit many of our usual activities, particularly our hands-on training workshops, the Centre for Biodiversity Analysis nevertheless accomplished a range of events and achievements over the past 12 months. We sustained engagement with our researchers and students from across our partner institutions and with those from further afield from other local and international institutions, and into the policy and management landscape. While our workshops and seminars remained considerably smaller in number this year and held mostly online, we continued to receive strong responses to our funding calls, with 5 Synthesis Group and 8 Ignition Grant proposals funded this year. Publications from previously funded CBA projects also continued to rise, with 10 new publications reported.

To welcome in 2021 and celebrate the renewal of CBA Mk3, we hosted our inaugural Research Mingle. This relaxed event aimed to create and expand networks amongst biodiversity science researchers from across ANU, University of Canberra and CSIRO. Over 70 scientists and students from across our partner institutions and ACT and Federal environment departments participated in 'get-to-know-you' activities and shared ideas and opportunities to collaborate across the CBA. Professor Keith Nugent, ANU's Deputy Vice-Chancellor (Research and Innovation) closed the event with some words on the recent commitment from

ANU's Vice-Chancellor and CSIRO's Chief Executive to enable stronger engagement across ANU and CSIRO - "a key national partnership", highlighting the CBA as a key part of building this National Precinct.

CBA Director Craig Moritz's co-authored Conversation article "The government's idea of 'national environment standards' would entrench Australia's global pariah status" highlighted Australia's ineffective environmental laws and lack of critical reforms.

In 2017, the CBA awarded an Ignition Grant to a team of researchers from ANU and CSIRO for their project "Uncovering the Hare Microbiome." This project aimed to explore the microbial diversity of hares, which could have implications for controlling the closely related European rabbit, a major pest in Australia. The grant allowed them to use emerging long-read sequencing technology (Nanopore) to study the hare microbiome. This collaboration connected CSIRO's viral expertise with ANU's genomic sequencing know-how. This year, the same team took on the critical role of sequencing ACT COVID-19 samples and comparing genomes to aid contact tracing in Canberra, sequencing approximately 15-30 genomes per day for ACT Health, showcasing the value of cross-institutional collaboration and how research methods can be quickly applied to address urgent real-world challenges.

The 2019-2020 bushfires had severe impacts on animal species, reducing populations and habitats. The Department of Agriculture, Water, and the Environment quickly devised a draft framework to prioritize emergency action for fire-affected vertebrates. Genetic assessments found incorrect taxonomic definitions, causing mis-prioritization and the potential loss of unknown species due to hidden diversity. Initial expert assessment organised by the CAB concluded that this is the case for many vertebrate species prioritised by the Wildlife and Threatened Species Bushfire Recovery Expert Panel. A project funded by NESP Threatened Species Hub and CBA has provided genetic information for 50 priority species, aiding threat reassessment. The project's final report, released in September, provides landscape genetic information, including detailed maps and summaries for each species, for approximately 50 priority species to assist with the reassessment of current threat listings.

Looking towards next year, in addition to our continuing Synthesis Group funding, we are planning to launch an addition to our Ignition grant program, Ignition+ grants. These larger grants (up to \$60K) will aim to foster substantial and enduring research collaborations for the CBA community via the development and sharing of new capabilities. We will trial this approach in the coming year, with the intent to make two such awards in addition to our usual Ignition grants. We will also invite our past and current Ignition grant and Synthesis Group recipients to share their projects at 10 year Science Symposium as part of our 10<sup>th</sup> birthday celebrations in 2022.

## Summary of the activities coordinated, facilitated and funded by the Centre for Biodiversity Analysis (Year 9, 2020-21).

Interactions and collaborations in **bold**. Detailed information on each activity is available on the CBA webpage via links.

Date	Activity	Type	Notes
Oct 2020	<a href="#">Genetic Diversity: Australian Indicators (G'DAI) Forum</a>	Workshop	CBA facilitated workshop in collaboration with <b>Bioplatform Australia's Threatened Species Initiative</b> and several international working groups, to discuss targets and indicators for genetic diversity as a preamble to the post-2020 Convention on Biological Diversity (CBD) forum. Anna MacDonald, Craig Moritz, Linda Neaves ( <b>ANU</b> ), Luciano Beheregaray, Martin Breed ( <b>Flinders U</b> ), Kathy Belov, Catherine Grueber, Carolyn Hogg ( <b>U Sydney</b> ), Sasha Pavlova, Paul Sunnucks ( <b>Monash U</b> ), Renee Catullo ( <b>UWA</b> ), Richard Frankham ( <b>Macquarie U</b> ), Peter Harrison ( <b>U TAS</b> ), Cynthia Riginos ( <b>U QLD</b> ), Andrew Young ( <b>CSIRO</b> ), Sean Hoban ( <b>The Morton Arboretum, Illinois</b> ), Peter Latch, Kat Miller, Anthony Whalen, Damian Wrigley ( <b>AEW, Aust Gov</b> ), Margaret Byrne, Kym Ottewell, Robyn Shaw ( <b>DBCA, WA Gov</b> ), Melinda Coleman ( <b>DPI, NSW Gov</b> ), Jennifer Pierson ( <b>ACT Gov</b> ).
Oct 2020	<a href="#">Academy Fellows say it's time to establish an independent biodiversity agency</a>	Policy knowledge exchange	A brief sent by <b>The Australian Academy of Science</b> , led by CBA Director Craig Moritz, to all Australian MPs and senators ahead of the debate on the Australian Government's Environment Protection and Biodiversity Conservation Amendment (Streamlining Environmental Approvals) Bill 2020.
Oct 2020	Round 5 <a href="#">Synthesis Group</a> and Round 12 of <a href="#">Ignition Grant</a> funding announced.	CBA grants	2 Synthesis Group and 6 Ignition Grant proposals received.
Nov 2020	Castelli, M., et al. 2020. Evolving thermal thresholds explain the distribution of temperature sex reversal in an Australian dragon lizard. <i>Divers Distrib.</i> ; 27: 427–438. <a href="https://doi.org/10.1111/ddi.13203">https://doi.org/10.1111/ddi.13203</a>	Publication	CBA-funded Ignition Project: Biogeography of sex reversal and the effects of climate change on reptile sex determination
Nov 2020	<a href="#">Synthesis groups</a> approved by Liaison Committee:		2 proposals funded (CBA funding: \$48,495)
1	Precision Landscape Regeneration – integrating climate change responses, production and biodiversity	Synthesis Group	Justin Borevitz (RSB, <b>ANU</b> ), Kirsty Yeates (RSB, <b>ANU</b> ), Wolfram Buss (RSB, <b>ANU</b> ), Eelco Rohlings (Earth Sciences, <b>ANU</b> ), Albert Van Dijk (Fenner, <b>ANU</b> ), Michelle Young (Fenner, <b>ANU</b> ),

Date	Activity	Type	Notes
			Craig Strong (Fenner, <b>ANU</b> ), Ida Kubiszewski (Crawford Public Policy, <b>ANU</b> ), Bob Costanza (Crawford Public Policy, <b>ANU</b> ), Francis Chiew (Land & Water, <b>CSIRO</b> ), Stuart Brown (manager Boorowa Agricultural Research Station, <b>CSIRO</b> ), Sue McIntyre (Land & Water, <b>CSIRO</b> / Fenner, <b>ANU</b> ), Rose Andrew ( <b>UNE</b> ), Phillipa McCormack ( <b>UTAS</b> ), Rowan Reid ( <b>Aust. Agroforestry</b> ), Henry Adams ( <b>Common Capital</b> ), Liz Clarke ( <b>Soils For Life</b> / Fenner, <b>ANU</b> ), Luke Peel (The <b>Mulloon Institute</b> ), Susan Orgill ( <b>NSW DPI</b> / Fenner, <b>ANU</b> ) Cris Brack (Fenner, <b>ANU</b> / Independent), Kate Andrews ( <b>NRM Australia</b> / Fenner, <b>ANU</b> ). CBA funding: \$24,495
2	Using thermal tolerance limits to understand species susceptibility under climate change	Synthesis Group	Karel Mokany (Land & Water, <b>CSIRO</b> ), Sam Andrew (Environomics FSP, <b>CSIRO</b> ), Joanne Bennett (CEEG, UC) Rachael Gallagher ( <b>Macquarie</b> ), Pieter Arnold (RSB, <b>ANU</b> ), Octavio Jimenez Robles (RSB, <b>ANU</b> ), Alicia Cook ( <b>UTS</b> ), Bryony Horton ( <b>Department of Planning, Industry and Environment</b> ), Enrico Rezende ( <b>Pontificia Universidad Católica de Chile</b> ), Jennifer Sunday ( <b>McGill University</b> ), Lydia Guja (ANBG / ANH, <b>CSIRO</b> ), Adrienne Nicotra (RSB, <b>ANU</b> ), Andrea Leigh ( <b>UTS</b> ), Rosalie Harris (RSB, <b>ANU</b> ), Veronica Briceño (RSB, <b>ANU</b> ), Michael Kearney ( <b>UMelbourne</b> ), Carla Sgró ( <b>Monash</b> ), Sharon Robertson ( <b>UWollongong</b> ), Timothy Feeley ( <b>UBritish Columbia</b> ), Ben Kefford (CEEG, <b>UC</b> ). CBA funding: \$24,000
Nov 2020	<a href="#">Ignition grants</a> approved by Liaison Committee:		2 proposals funded (CBA funding: \$20,000)
1	Comparative phylogeography of a unique obligate pollination mutualism	Ignition Grant	Liz Milla, Francisco Encinas-Viso (ANH, NRCA, <b>CSIRO</b> ), Bernd Gruber (CEEG, IAE, <b>UC</b> ). CBA funding: \$10,000
2	Developing a collections-based reference dataset for species identification in environmental DNA (eDNA) monitoring	Ignition Grant	Linda Neaves, Adrian Manning (FSES, <b>ANU</b> ), Sue McIntyre, Andrew Young, Linda Broadhurst, Andreas Zwick (NRCA, <b>CSIRO</b> ). CBA funding: \$10,000
Nov 2020	<a href="#">Ideas Mingle</a>	Knowledge exchange, network building & social event	An environmental research networking event with the <b>ACT Government Environment, Planning &amp; Sustainable Development Directorate</b> (EPSDD).
Nov 2020	<a href="#">Genetic assessment of priority taxa and management priorities</a>	Co-funded project	<b>National Environmental Science Programme Threatened Species Recovery Hub</b> grant (\$124K). CBA co-contribution: \$20,000.
Dec 2020	Nonthakorn, A., et al. 2020. The effects of development and chronic oxidative stress on telomere length in an agricultural pest moth, <i>Helicoverpa armigera</i> . bioRxiv DOI: <a href="https://doi.org/10.1101/2020.12.15.422848">10.1101/2020.12.15.422848</a>	Publication	Student Ignition Project: Telomere length as a biomarker for stress in an Australian pest moth

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Dec 2020	<a href="#">ACT Science Plan launched</a>	Knowledge brokering and network building	Minister for the Environment Rebecca Vassarotti launched the <b>ACT Government Science Plan</b> alongside partners from ANU, U Canberra and CSIRO. Launch organised and attended by CBA Knowledge Broker Paula Doyle.
Jan 2021	Grealy, A., et al. 2021. Genetic barcoding of museum eggshell improves data integrity of avian biological collections. Sci Rep 11, 1605. <a href="https://doi.org/10.1038/s41598-020-79852-4">https://doi.org/10.1038/s41598-020-79852-4</a>	Publication	CBA-funded Ignition Project: Barcoding and capture-based approaches for eggshell genomics to improve biodiversity assessment in Australian birds
Feb 2021	<a href="#">Research Mingle</a>	Network building and social event	Aimed to create and expand networks amongst biodiversity science researchers from across <b>ANU, University of Canberra</b> and <b>CSIRO</b> .
Feb 2021	Joyce, Elizabeth & Thiele, Kevin & Slik, Ferry & Crayn, Darren. 2021. Plants will cross the lines: climate and available land mass are the major determinants of phytogeographical patterns in the Sunda-Sahul Convergence Zone. Biological Journal of the Linnean Society. 1-14.	Publication	Synthesis Group: Crossing Lines: a new synthesis on Asian, Melanesian and Australian biotic exchange
Mar 2021	<a href="#">Using R to integrate data and tailor-made population genomic simulations over space and time</a>	Technical workshop	Introduction to slimr, by its developer, ECR Russel Dinnage and colleagues, <b>University of Canberra</b> .
April 2021	Round 6 <a href="#">Synthesis Group</a> and Round 13 of <a href="#">Ignition Grant</a> funding announced.	CBA grants	3 Synthesis Group and 9 Ignition Grant proposals received.
April 2021	Frankham, R. 2021. Suggested improvements to proposed genetic indicator for CBD. Conserv Genet 22, 531-532. <a href="https://doi.org/10.1007/s10592-021-01357-y">https://doi.org/10.1007/s10592-021-01357-y</a> Laikre, L. et al. 2021. Authors' Reply to Letter to the Editor: Continued improvement to genetic diversity indicator for CBD. Conservation Genetics (2021) <a href="https://doi.org/10.1007/s10592-021-01359-w">https://doi.org/10.1007/s10592-021-01359-w</a>	Publications	CBA-facilitated workshop: <a href="#">Genetic Diversity: Australian Indicators (G'DAI) Forum</a>
May 2021	Catullo, R. et al. 2021. Benchmarking Taxonomic and Genetic Diversity After the Fact: Lessons Learned From the Catastrophic 2019–2020 Australian	Publication	CBA-facilitated workshop: <a href="#">Spatial genetics in fire-ground fauna</a>

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	Bushfires Front. Ecol. Evol. 9: 292. <a href="https://doi.org/10.3389/fevo.2021.645820">https://doi.org/10.3389/fevo.2021.645820</a>		
May 2021	Liaison Committee Meeting	Meeting	
May 2021	<a href="#">Synthesis groups</a> approved by Liaison Committee:		3 proposals funded (CBA funding: \$71,543)
1	Conservation Genetics in ACTION: a case study for the incorporation of genetic theory into management processes	Synthesis Group	Linda Neaves (Research Fellow, Fenner, <b>ANU</b> ), Brittany Brockett (PhD student, Fenner, <b>ANU</b> ), Stephen Sarre (Prof, CCEG, <b>UC</b> ), Linda Broadhurst (Research Scientist ANH, Director CANBR, CSIRO), Andrew Young (Research Scientist ANH, Director NRCA, <b>CSIRO</b> ). CBA funding: \$24,623
2	Combining genomic data, new inference methods and long-term population data to uncover population processes	Synthesis Group	Simon Clulow (Senior Research Fellow, CCEG, <b>UC</b> ), Richard Duncan (Prof, CCEG, <b>UC</b> ), Sally Potter (postdoc, RSB, <b>ANU</b> ), Kevin Oh (Health & Biosecurity, <b>CSIRO</b> ). CBA funding: \$21,920
3	High Country Eucalypt Dieback Synthesis Network	Synthesis Group	Adrienne Nicotra (Prof, RSB, <b>ANU</b> ), Matt Brookhouse (Snr Lecturer, Fenner, <b>ANU</b> ), Jessica Ward-Jones (PhD student, Fenner, <b>ANU</b> ), Zachary Brown (ECR, RSB, <b>ANU</b> ), Pieter Arnold (Postdoc, RSB, <b>ANU</b> ), Jamie Pittcock (Prof, Fenner, <b>ANU</b> ), Saul Cunningham (Prof, Fenner, <b>ANU</b> ), Celeste Linde (Prof, RSB, <b>ANU</b> ), Justin Borevitz (Prof, RSB, <b>ANU</b> ), Linda Broadhurst (Research Scientist, ANH, Director CANBR, <b>CSIRO</b> ), David Bush (Senior scientist, Director Australian Tree Seed Centre, <b>CSIRO</b> ), Lydia Guja (EMCR, <b>CSIRO</b> /ANBG), Duanne White (A.Prof, Centre for Applied Water Science, <b>UC</b> ), Leah Moore (A.Prof, <b>UC</b> ). CBA funding: \$25,000
May 2021	<a href="#">Ignition grants</a> approved by Liaison Committee:		6 proposals funded (CBA funding: \$59,988)
1	Microbiome of <i>Eucalyptus viminalis</i> and <i>E. pauciflora</i> and its association with eucalypt dieback	Ignition Grant	Erin Hahn (Postdoc, ANWC, <b>CSIRO</b> ), Clare Holleley (Senior Research Fellow, ANWC, <b>CSIRO</b> ), Alejandro Trujillo Gonzalez (Postdoc, CCEG, <b>UC</b> ), Linda Neaves (Research Fellow, Fenner, <b>ANU</b> ). CBA funding: \$10,000
2	Assessing variation in the susceptibility of <i>E. blakleyi</i> to psyllid attack using leaf chemistry traits	Ignition Grant	Celeste Linde (Prof, RSB, ANU), Ben Gooden (ECR, Health and Biosecurity, CSIRO), Gavin Hunter (ECR, Health and Biosecurity, CSIRO), Leah Moore (A.Prof, Earth Sciences, ANU), Tracey Steinrucken (Postdoc, Health and Biosecurity, CSIRO), Ara Chowdhury Hosna (HDR student, RSB, ANU). CBA funding: \$9,988
3	Synthetic biology conservation approach to conserving amphibian species impacted by the amphibian-killing chytrid fungus	Ignition Grant	Madison Fink (PhD student, RSB, <b>ANU</b> ), Megan Head (ARC Future Fellow, RSB, <b>ANU</b> ), David Bush (Senior scientist, Director Australian Tree Seed Centre, <b>CSIRO</b> ), Hannah Windley (Early career, <b>ACT Parks and Conservation Service</b> ), Rosie Cooney (Director of Conservation Research, <b>ACT Government</b> , Environment

Date	Activity	Type	Notes
			Protection and Sustainable Development Directorate ( <b>EPSDD</b> ), Greg Baines (Senior ecologist, <b>EPSDD</b> ). CBA funding: \$10,000
4	Comparative Hi-C of northern Australian <i>Gehyra</i> : do chromosomal rearrangements restrict gene flow in sympatric species?	Ignition Grant	Simon Clulow (Senior Research Fellow, CCEG, <b>UC</b> ), Caitlin Cooper (ECR, Research Scientist Australian Centre for Disease Preparedness, <b>CSIRO</b> ), Anthony Waddle (PhD student, UMelb/ACDP, <b>CSIRO</b> ). CBA funding: \$10,000
5	Skinks with thermolabile sex as sensitive indicators of environmental change	Ignition Grant	Emily Roycroft (Postdoc, RSB, <b>ANU</b> ), Stephen Zozaya (Postdoc, RSB, <b>ANU</b> ), Janine Deakin (Prof, CCEG, <b>UC</b> ). CBA funding: \$10,000
6	How will alpine soil invertebrate communities respond to drier soils and changing snow dynamics due to climate change?	Ignition Grant (student co-supervision)	Duminda Dissanayake (PhD student, CCEG, <b>UC</b> ), Sarah Whiteley, (PhD student, CCEG, <b>UC</b> ), Susan Wagner (Postdoc, CCEG, <b>UC</b> ), Adrienne Nicotra (Prof, RSB, <b>ANU</b> ), Ben Kefford (A.Prof. Centre for Applied Water Science, <b>UC</b> ), Clare Holleley (Senior Research Fellow, ANWC, <b>CSIRO</b> ), Blair Trewin (Climate Scientist, <b>Bureau of Meteorology</b> ), Arthur Georges (Prof, CCEG, <b>UC</b> ), Rick Shine (Prof, Macquarie University). CBA funding: \$10,000
June 2021	<a href="#">DARt PIPs Workshop - Data Ecology Model</a>	Workshop	CBA-facilitated meeting - First stakeholder meeting for the DARt PIP project ( <b>UC, DARt, ANU, ACT Government</b> )
June 2021	<a href="#">Ladies who Lunch</a> launched	Network building	Developed by CBA Knowledge Broker Paula Doyle to provide people with the opportunity to expand their networks through informal lunch time gatherings.
June 2021	Forbes, O., et al. 2021. Bayesian spatio-temporal modelling to assess the role of extreme weather, land use change and socio-economic trends on cryptosporidiosis in Australia, 2001–2018. <i>Science of The Total Environment</i> , 791. <a href="https://doi.org/10.1016/j.scitotenv.2021.148243">https://doi.org/10.1016/j.scitotenv.2021.148243</a> .	Publication	Ignition Project: <a href="#">Biodiversity change: A risk factor for human health?</a>
June 2021	Camac, J. S., Umbers, K. D. L., Morgan, J. W., Geange, S. R., Hanea, A., Slatyer, R. A., McDougall, K. L., Venn, S. E., Vesk, P. A., Hoffmann, A. A., & Nicotra, A. B. 2021. Predicting species and community responses to global change using structured expert judgement: An Australian mountain ecosystems case study. <i>Global Change Biology</i> , 27, 4420–4434.	Publication	Synthesis Group: Using expert elicitation to identify impacts of climate change on Australia's alpine animals
June 2021	<a href="#">The government's idea of 'national environment standards' would entrench Australia's global pariah status</a>	Policy knowledge exchange	CBA Director Craig Moritz's co-authored article in The Conversation discussing the independent Review of the EPBC Act.

Date	Activity	Type	Notes
July 2021	<a href="#">ARC Centre of Excellence</a> bid submitted	Grant application	<b>ARC CoE</b> for Transformative Species Discovery and Diagnostics (for funding commencing 2023). Bid led by Jane Melville ( <b>Monash/Museums VIC</b> ); participants from <b>ANU, UAdelaide, DARt, UWA, JCU, SA Herbarium, WA Museum, QLD Museum, CSIRO</b> . Unsuccessful.
July 2021	<a href="#">ACT Minister Meeting</a>	Network building and knowledge brokering	CBA Knowledge Broker Paula Doyle and CBA Director Craig Moritz met with Rebecca Vassarotti, Minister for the Environment, Jo Clay, Member for Ginninderra and Ian Walker, ACT Conservator Flora and Fauna.
Jul 2021	<a href="#">Building knowledge to action networks</a>	Network building	Developed by CBA Knowledge Broker Paula to provide professional networkers opportunities to grow skills, share information and develop best practise.
Jul 2021	Semple, T. L., Vidal-García, M., Tatarinic, N. J., & Peakall, R. 2021. Evolution of reproductive structures for in-flight mating in thynnine wasps (Hymenoptera: Thynnidae: Thynninae). <i>Journal of Evolutionary Biology</i> , 34, 1406–1422.	Publication	Ignition Project: Tackling the unknown – a next-generation phylogenetics approach to explore the immense diversity of Australian thynnine wasps (Tiphidae: Thynninae)
Aug 2021	<a href="#">Developing linkages with ACT Government</a>	Network building and knowledge brokering	UC ScTech Executive Dean, Janine Deakin and CBA Knowledge Broker Paula Doyle met with Ian Walker, ACT EPSDD Conservator Flora and Fauna and Rosie Cooney, ACT EPSDD Director Conservation Research.
Aug 2021	<a href="#">Ignition Project team takes on rapid COVID-19 sequencing</a>	Continued collaboration	A CBA Ignition Grant brought together the team that provided crucial COVID-19 genome information to ACT Health.
Sep 2021	<a href="#">Genetic assessment of bushfire-impacted vertebrate species: Final report</a>	Workshop report	CBA-facilitated workshop: <a href="#">Spatial genetics in fire-ground fauna</a> and co-funded NESP Threatened Species Hub project: <a href="#">Genetic assessment of priority taxa and management priorities</a>
Oct 2021	<a href="#">Developing best-practice for eDNA in monitoring and management</a>	Symposium & workshop	CBA-facilitated workshop symposium and workshop to establish the National Environmental DNA Test Protocols (NETPs).
Oct 2021	Liaison Committee Meeting	Meeting	
Oct 2021	Forbes, O., et al. 2021. Bayesian spatio-temporal modelling to assess the role of extreme weather, land use change and socio-economic trends on cryptosporidiosis in Australia, 2001–2018. <i>Science of The Total Environment</i> , 791.	Publication	Project: <a href="#">Biodiversity change: A risk factor for human health?</a>

## CBA Projects in progress (funded in previous 12 months)

Project	Update (provided by grant recipients)
<p>Planning with plasticity: Shifting management and conservation paradigms by integrating biological and organizational plasticity (Dec 2019)</p> <p>Rebecca Fox (E&amp;E, RSB, ANU), Alistair Hobday (Marine Climate Impact &amp; Adaptation, CSIRO), Jennifer Donelson (JCU), Juan-Diego Gaitan-Espitia (Hong-Kong University), Karel Mokany (L&amp;W, CSIRO), Ryan Murphy (Australian Fisheries Management Authority), Chris Cvitanovic (ANU, Centre for Public Awareness of Science), Jessica Hoey (Great Barrier Reef Marine Park Authority), Sam Andrew (Environomics FSP &amp; Environmental Futures, CSIRO), Carly Cook (Monash University)</p>	<p>Synthesis Group activities have been delayed due to COVID-19. We changed our meeting plans and held a virtual workshop in September 2020 using an online meeting facilitator with around 15 participants. A manuscript is being prepared for <i>Nature Climate Change</i>.</p>
<p>Beating the heat? Population genomics of climate change in Australian birds (Honours project) (Mar 2018)</p> <p>Sasha Mikheyev, Janet Gardener, ANU, Elroy Au (RSB hon student); Leo Joseph CSIRO</p>	<p>ANU-CSIRO con-supervised honours student Elroy Au commenced the project in 2019. His honours thesis was submitted in 2020: 'Population genomics of climate change in the Australian bird <i>Malurus lamberti</i>'.</p>
<p>Using data on avian performance to enhance Mallee restoration under climate change (Dec 2019)</p> <p>Lynda Sharpe, Janet Gardner (E&amp;E, RSB, ANU); and Suzanne Prober (Adaptive Ecosystem Management CSIRO Land and Water).</p>	<p>Bird thermoregulatory behaviour and weather data was collected at the study site (Calperum Station, South Australia) in Jan–Feb 2020. Data is being analysed and manuscript prepared for <i>Frontiers in Ecology and Evolution</i>.</p>
<p>Energetic costs of sex reversal in lizards: implications for understanding evolutionary transitions between environmental and genotypic sex determination (Dec 2019)</p> <p>Daniel Noble, Essie Rodgers, E&amp;E, RSB, ANU; and Stephen Sarre, Arthur Georges, Kris Wild (PhD student), Duminda Dissanayake (PhD student), IAE, UC.</p>	<p>COVID-related restrictions has limited field and lab work. Fieldwork in the Brindabella Ranges is planned for November 2021 to look for <i>Bassiana duperreyi</i> nests to place temperature dataloggers in to monitor nest temperatures.</p>

Project	Update (provided by grant recipients)
<p>Biodiversity of CO2 use among toxic bloom forming cyanobacteria (Dec 2019)</p> <p>Anusuya Willis, Australian National Algae Culture Collection, CSIRO; and Ben Long, PS, RSB, ANU.</p>	<p>Due to COVID-related delays with equipment deliveries and set-up the project has been delayed and has been extended to the end of 2021. Funds proposed for domestic travel (for Ben to travel to Hobart for the experimental set-up) that could not be used due to travel restrictions were used for additional qPCR samples. The experiments are running well now. Every experimental run takes at least 4 weeks, with completion estimated for the end of September.</p>
<p>Exploring Australia's diversity for pathogens of weeds (student project) (Dec 2019)</p> <p>Peter Solomon PS, RSB, ANU; Oliver Mead, ANH, CSIRO; Andrew Milgate, NSW DPI; Alexandra Tabor, Dalness Farm.</p>	<p>Due to COVID-related delays, no student has been recruited to this project yet.</p>
<p>Using herbarium specimens to determine the drivers of mast seeding in spinifex and hence the drivers of boom-bust growth in vertebrate populations of arid Australia (student project) (Dec 2019)</p> <p>Richard Duncan, Will Higgisson, Edward Calaby, Bernd Gruber, Stephen Sarre IAE, <b>UC</b>; Brendan Lepschi, Linda Broadhurst, ANH, <b>CSIRO</b>; Tom North, DoEE.</p>	<p>Due to COVID-related delays, no student has been recruited to this project yet.</p>
<p>A comparative approach to understanding gene flow in avian species across Sahul (student project) (Dec 2019)</p> <p>Craig Moritz, E&amp;E, RSB, <b>ANU</b> &amp; and Leo Joseph, ANWC, <b>CSIRO</b>. \$5K Lab work, \$5K student stipend.</p>	<p>Due to COVID-related and personal delays, co-supervised ANU-CSIRO honours student Heather Johnston only commenced this project Semester 2, mid-2020.</p>