

Centre for  
Biodiversity  
Analysis



# Centre for Biodiversity Analysis 2019-20 Annual Report

October 2020

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Established in 2012, the CBA is a joint initiative of ANU, CSIRO and University of Canberra founded on world-class biodiversity science spanning evolutionary biology, genomics, bioinformatics, spatial modelling, population and ecosystem ecology, and paleoecology; and key infrastructure such as the National Biological Collections and advanced genomic and computer laboratories.

The CBA operates as a highly collaborative partnership with a core focus of incorporating evolutionary biology, genomics, bioinformatics, spatial modelling, and population and ecosystem ecology into the discovery, understanding and conservation of Australia's biodiversity in the face of accelerating environmental change. The CBA has built an interactive research community with the support and engagement of ~70 labs across ANU, CSIRO and UC.

In an extraordinarily strange and difficult year, and with COVID restrictions limiting many of our usual activities, particularly our hands-on training workshops, the CBA nevertheless accomplished a range of events and achievements (see summary below).

Not least of our achievements was securing support for the renewal of the CBA. Copied below is the CBA engagement (2012-19) document developed in Jan 2020 to assist with funding renewal discussions. The Centre's operation for a further five more years has been enabled by contributions from ANU (Research School of Biology, Fenner School of Environment and Society, College of Science & DVCR), CSIRO (National Research Collections Australia and Health & Biosecurity), and the University of Canberra (Centre for Conservation Ecology and Genetics). As part of the renewal, the ANU-based Ecogenomics and Bioinformatics Lab (EBL) will come under the umbrella of the CBA. The Centre will continue to advance its cross-institutional research, ECRs training opportunities, targeted recruitment of joint ANU-CSIRO Honours and PhD students and knowledge exchange activities of the past eight years whilst looking for opportunities to align our science with strong impact to community and government and important strategic areas in our partners.

Before lockdowns and restrictions, the CBA hosted two international scientists who presented seminars and workshops for the CBA community. Our changed, covid-restricted landscape meant we, like so many others, had to pivot our meetings, workshops and seminars online. As restrictions ease, we hope to return to more face-to-face events in the coming year. Indeed, a focus of CBA Mk 3 will be to reach out to our ECRs to determine the types of training activities, or other opportunities, they need to address their specific research requirements and interests.

Over the past 12 months, capacity enabled by the Biopatforms Australia projects and the CBA network of universities, CSIRO and museums was mobilised to develop the Australian Amphibian and Reptile Genomics initiative, and to compile information on taxonomic and genetic diversity of fire-impacted vertebrates for government agencies undertaking rapid conservation assessments in response to the devastating fires of the 2019-20 summer. Led by Diversity Arrays Technology (DART), a \$1.2M project, 'EcoKDDaRT: Future Proofing Biodiversity and Biosecurity', was funded by the ACT Government Priority Investment Program (PIP). As part of the project, the Centre for Biodiversity Analysis will coordinate and

deliver engagement and training workshops and a mini grant scheme (to enable beta-testing of the Big Data platform).

Our long-term goal of taking biodiversity science from the lab into the policy landscape continued to advance with the Evolutionary Science EMCR forum, including a sold-out public panel discussion on 'Evolutionary Science for a Changing World' at the Shine Dome, in collaboration with the Australian Academy of Science's National Committee for Ecology, Evolution and Conservation. CBA Knowledge Broker Paula Doyle coordinated meetings with biodiversity scientists at ANU, UC and CSIRO with local and federal environmental policy makers and managers, and facilitated events such as the one day workshop 'Adaptations to climate change - science and policy perspectives' and Policy Impact Masterclass hosted in collaboration with ANU's Public Policy & Societal Impact Hub.

# CBA engagement (2012-19)

Document developed to assist with funding renewal discussions (Jan 2020)

## The ANU-CSIRO-UCanberra Centre of Biodiversity Analysis

The Centre for Biodiversity Analysis operates as a highly collaborative, cross-institutional partnership across the ANU (RSB, FSES, CHL), CSIRO (NRCA, Land & Water, Agriculture, Health & Biosecurity) and U Canberra (IAE). The CBA was established in 2012 on the arrival of Craig Moritz (ARC Laureate) at ANU. The goals of the CBA were to (i) substantially increase collaboration in biodiversity science research and training across institutions; and (ii) increase the national and international visibility of our capacity and science in this area. This fitted well with ANU's Strategic plan that aims for stronger interactions with other regional research institutions, including CSIRO.



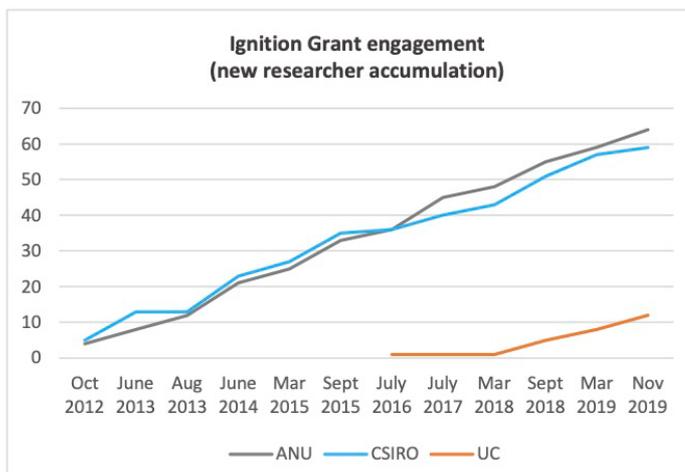
**CBA mission statement:** Through collaborative science and training, to promote understanding and conservation of Australia's unique biodiversity in the face of accelerating environmental change.

Connect	Build	Apply
 <p>Collaborative research</p> <ul style="list-style-type: none"> <li>• Ignition Grants</li> <li>• Synthesis Groups</li> </ul> <p>Symposia &amp; Conferences</p> <p>Visiting scientists</p>	 <p>ECR advanced training workshops</p> <p>Joint ECR research &amp; student projects</p> <p>Co-supervision across institutions</p>	 <p>Knowledge exchange between science, policy &amp; management</p> <ul style="list-style-type: none"> <li>• Synthesis Groups</li> <li>• Knowledge Broker</li> </ul>

### Engagement

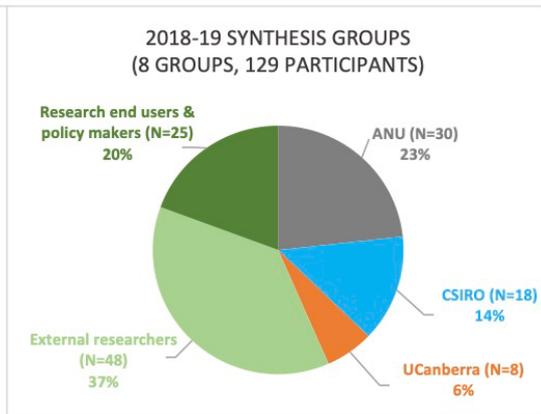
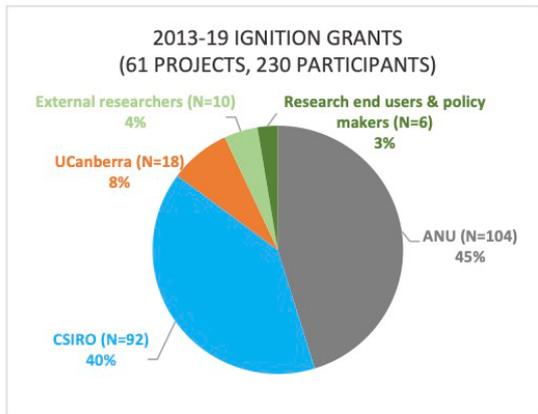
Over 70 lab groups from across ANU, UC and CSIRO have engaged with the CBA via Ignition Grant, Synthesis Groups and Visiting Scientist funding programs (plus more through workshop, seminar, symposia and conference attendance).

Further funding initiated from CBA-funded projects has included SIEF-RI (including the Ecogenomics and Bioinformatics Laboratory); ARC Linkage, Discovery and LEIF; CSIRO FSP; ABRs and Bioplatforms Australia.



*"Overall it was a great opportunity to have this shared CBA grant together with outstanding collaborators. It was a great pleasure to work together and to build new networks. This was especially important as an EMCR. This grant really helped in establishing new directions for my new research group. In short, the impact of this small grant can hardly be overstated." ANU EMCR, Dec 2019.*

*"The Ignition Grants are a very effective scheme to kick-start novel ANU-CSIRO collaborative research. The seed funding provided was crucial in developing a more substantial research proposal." CSIRO Research Scientist, Nov 2016.*



*"This is the best grant scheme of its type I have come across in my life so far. Keep it up! Little chunks of money for pilot experiments is exactly what ECRs need. Expand the scheme if you can!"* ANU Postdoc, Nov 2016

*"Our synthesis workshop also helped dynamize Canberra's quantitative genetic community which now holds a monthly meeting to discuss journal articles and new research projects with participants from RSB, CSIRO and UC."* ANU EMCR, Nov 2018.

*"I truly hope CBA is successful in your re-funding bid as I think CBA is really important for researchers, particularly EMCRs, to establish collaborations and to generate important initial data that serves as baseline from which to attract larger research funds."* CSIRO EMCR, Dec 2019.

*"Our synthesis funds were very successful in establishing a large number of collaborations and interactions with researchers outside the ANU. In addition, the synthesis funds have been instrumental in training students both in comparative and meta-analysis about each other's fields and the challenges and approaches in each."* ANU EMCR, Dec 2019.

### Training workshops



*"The activities offered by the CBA have been very important during my PhD project, especially the workshops."* ANU PhD student, Nov 2016.

*"CBA's workshops provide excellent opportunities to learn from and network and interact with presenters that may not otherwise come to Canberra."* CSIRO Research Scientist, Nov 2016.

### Co-supervised students

- 10 RSB-CSIRO Honours/Masters projects have been funded via the CBA Ignition Grant program (stipend and research funds).
- 3 Fenner PhD students and 1 RSB PhD student with CSIRO co-supervisors have received Ignition Grant funding (research funds).
- 15 co-supervised ANU-CSIRO students have been, or are currently, working under the CBA Umbrella Agreement (Honours, Masters, PhD).
- Two students with RSB supervisors are currently recipients of CSIRO Supplementary Postgraduate Scholarships.

*"The Ignition Grant I received allowed me to see my honours year as much more than a university assessment. It gave me an incredible opportunity and working with CSIRO encouraged me to think about the potential consequences and applications of my research. It also helped fund conference attendance and I feel attributed to the beginning of an exciting science career for me."* ANU Hons student, Nov 2016.

*"This funding was integral to my PhD project, and development as an early-career scientist, facilitating networks with the CSIRO."* ANU PhD student, Dec 2019.

## Summary of the activities coordinated, facilitated and funded by the Centre for Biodiversity Analysis (Year 8, 2019-20).

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

Date	Activity	Type	Notes
Nov 2019	Round 4 <a href="#">Synthesis Group</a> and Round 11 of <a href="#">Ignition Grant</a> funding announced.	CBA grants	2 Synthesis Group and 6 Ignition Grant proposals received.
Nov 2019	Tallowin, OJS, et al. 2019. The other side of the Sahulian coin: biogeography and evolution of Melanesian forest dragons (Agamidae), <i>Biological Journal of the Linnean Society</i> , 129: 99–113, <a href="https://doi.org/10.1093/biolinnean/blz125">https://doi.org/10.1093/biolinnean/blz125</a>	Publication	Project: Curating spatial data to understand patterns and processes shaping biodiversity in New Guinea
Nov 2019	<a href="#">Long-read, long-reach sequencing workshop</a>	Technical workshop	5-day workshop in collaboration with the Ecogenomics and Bioinformatics Lab. CBA contribution to catering, flights, accommodation, lab supplies: \$26,794.
Nov 2019	<a href="#">Adaptations to climate change - science and policy perspectives</a>	Knowledge exchange symposium & workshop	1 day meeting at UCanberra. Speakers: Will Howard, <b>Department of the Environment and Energy</b> , Craig Moritz, Adrienne Nicotra, <b>ANU</b> , Paula Doyle, CBA, Janine Deakin, Arthur Georges, Meghan Castelli, Steven Sarre, Jim Hone, Jill Bartlett, Ben Kefford, Kyle Hemming, Ross Thompson, <b>UC</b> , Paul Rymer, <b>WSU</b> , Clare Holleley, <b>CSIRO</b> .
Nov 2019	<a href="#">Genomics of Australian reptiles and amphibians</a>	Round table workshop	1-day workshop at ANU/online to scope possible Bioplatforms Australia investment in the genomics of Australian reptiles and amphibians. Renee Catullo ( <b>ANU</b> ), Hardip Patel ( <b>ANU</b> ), Jennifer Graves ( <b>Latrobe</b> ), Michael Mahony ( <b>Newcastle</b> ), Stephen Frankenberg ( <b>UniMelb</b> ), Alastair Freeman ( <b>QLD Gov</b> ), Catherine Gruber ( <b>UniSyd</b> ), Chris Banks ( <b>ZoosVic</b> ), David Chapple ( <b>Monash</b> ), Geoff While ( <b>UniTas</b> ), Gerry McGilvray ( <b>NSW Gov</b> ), Graeme Gillespie ( <b>NT Gov</b> ), Jane Melville ( <b>MusVIC</b> ), Jennifer Ovenden ( <b>UniQLD</b> ), Jo Sumner ( <b>MusVIC</b> ), Jodi Rowley ( <b>AustMus</b> ), Kate Hodges ( <b>QLD Gov</b> ), Katherine Belov ( <b>UniSyd</b> ), Megan Higgie ( <b>JCU</b> ), Nancy Fitzsimmons ( <b>Griffith</b> ), Paul Oliver ( <b>Griffith</b> ), Rebecca Johnson ( <b>AustMus</b> ), Renee Brawata ( <b>ACT Gov</b> ), Richard Edwards ( <b>UNSW</b> ), Shane Ruming ( <b>NSW Gov</b> ), Steve Donnellan ( <b>SAM</b> ), Terry Bertozzi ( <b>SAM</b> ), Andrew Gilbert ( <b>BioplatformsAust</b> ), Anna Macdonald ( <b>ANU</b> ), Arthur Georges ( <b>UCanberra</b> ), Ben Sheele ( <b>ANU</b> ), Camilla Whittington ( <b>UniSyd</b> ), Clare Holleley ( <b>CSIRO</b> ),

Date	Activity	Type	Notes
			Craig Moritz ( <b>ANU</b> ), Daniel Noble ( <b>ANU</b> ), Erik Wapstra ( <b>UniTas</b> ), Ian Brennan ( <b>ANU</b> ), Janine Deakin ( <b>UCanberra</b> ), Jeffrey Christiansen (QCIF), Jennifer Pierson ( <b>ACT Gov</b> ), Johan Gustafsson ( <b>UniMelb</b> ), Kate Sanders ( <b>Adelaide</b> ), Margaret Byrne (WA Gov), Mark Eldridge ( <b>AustMus</b> ), Michael Gardner ( <b>Flinders</b> ), Nicki Mitchell ( <b>UWA</b> ), Oliver Griffith ( <b>UniMelb</b> ), Parwinder Kaur ( <b>UWA</b> ), Peri Bolton ( <b>Fed Gov</b> ), Peter Latch ( <b>Fed Gov</b> ), Rob Miller ( <b>New Mexico</b> ), Rustamzhon Turakulov ( <b>ANU</b> ), Scott Keogh (ANU), Simon Clulow ( <b>Macquarie</b> ), Stephanie Palmer ( <b>ANU</b> ), Stephen Sarre ( <b>UCanberra</b> ), Sophie Mazard ( <b>BioplatformsAust</b> ), Tariq Ezaz ( <b>UCanberra</b> ), Vicki Thomson (Adelaide), Nicholas MacGregor (Fed Gov), Paul Doughty ( <b>WAMus</b> ). CBA funding \$450 (afternoon tea catering)
Dec 2019	AAS Evolutionary Science EMCR forum and <a href="#">Evolutionary Science for a Changing World</a>	Workshop & public panel discussion	Forum participants: Maja Adamska, Rachael Brown, Xia Hua, Daniel Noble, Lexing Xie, <b>ANU</b> , Jimmy Breen, AdelaideU, Joshua Christie, Kate Lynch, Peter Takacs, Carl Brusse, <b>USydney</b> , Andrew Zalesky, Ben Phillips, <b>UMelbourne</b> , Richard Nock <b>CSIRO/NICTA</b> . Panel Discussion speakers: Lindell Bromham, Bob Williamson, Craig Moritz, <b>ANU</b> , Paul Griffiths, <b>U Sydney</b> , Nina Wedell, <b>U Exeter</b> . Co-sponsored by The Centre for Biodiversity Analysis, ANU, University of Adelaide, University of Sydney and the Australian Academy of Science (CBA funding: \$10,000).
Dec 2019	<a href="#">Synthesis groups</a> approved by Liaison Committee:		1 proposal funded (CBA funding: \$21,467)
1	Planning with plasticity: Shifting management and conservation paradigms by integrating biological and organizational plasticity	Synthesis Group	<b>Rebecca Fox</b> (E&E, RSB, ANU), <b>Alistair Hobday</b> (Marine Climate Impact & Adaptation, CSIRO), <b>Jennifer Donelson</b> (JCU), <b>Juan-Diego Gaitan-Espitia</b> ( <b>Hong-Kong University</b> ), Karel Mokany (L&W, CSIRO), Ryan Murphy ( <b>Australian Fisheries Management Authority</b> ), Chris Cvitanovic ( <b>ANU</b> , Centre for Public Awareness of Science), Jessica Hoey ( <b>Great Barrier Reef Marine Park Authority</b> ), Sam Andrew (Environomics FSP & Environmental Futures, <b>CSIRO</b> ), Carly Cook ( <b>Monash University</b> ) - <b>Workshop</b> . CBA funding: \$21,467
Dec 2019	<a href="#">Ignition grants</a> approved by Liaison Committee:		6 proposals funded (CBA funding: \$59,834)
1	Using data on avian performance to enhance Mallee restoration under climate change	Ignition Grant	Fieldwork, equipment hire. Lynda Sharpe, Janet Gardner (E&E, RSB, <b>ANU</b> ); and Suzanne Prober (Adaptive Ecosystem Management <b>CSIRO</b> Land and Water). CBA funding: \$9,950

Date	Activity	Type	Notes
2	Energetic costs of sex reversal in lizards: implications for understanding evolutionary transitions between environmental and genotypic sex determination	Ignition Grant	Labwork, fieldwork. Daniel Noble, Essie Rodgers, E&E, RSB, <b>ANU</b> ; and Stephen Sarre, Arthur Georges, Kris Wild (PhD student), Duminda Dissanayake (PhD student), IAE, <b>UC</b> . CBA funding: \$10,000
3	Biodiversity of CO2 use among toxic bloom forming cyanobacteria	Ignition Grant	Anusuya Willis, Australian National Algae Culture Collection, <b>CSIRO</b> ; and Ben Long, PS, RSB, <b>ANU</b> . CBA funding: \$9,960
4	Exploring Australia's diversity for pathogens of weeds (student project)	Ignition Grant	Peter Solomon PS, RSB, <b>ANU</b> ; Oliver Mead, ANH, <b>CSIRO</b> ; Andrew Milgate, <b>NSW DPI</b> ; Alexandra Tabor, <b>Dalness Farm</b> . CBA funding: \$10,000
5	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)	Ignition Grant	Richard Duncan, Will Higgsion, Edward Calaby, Bernd Gruber, Stephen Sarre IAE, <b>UC</b> ; Brendan Lepschi, Linda Broadhurst, ANH, <b>CSIRO</b> ; Tom North, DoEE. CBA funding: \$9,924
6	A comparative approach to understanding gene flow in avian species across Sahul (student project)	Ignition Grant (student co-supervision)	Craig Moritz, E&E, RSB, <b>ANU</b> & and Leo Joseph, ANWC, <b>CSIRO</b> . \$5K Lab work, \$5K student stipend. CBA funding: \$10,000
Feb 2020	<a href="#">Exploring the evolutionary origin of insect wings from an evo-devo perspective</a>	Visiting Scientist Seminar	CBA contribution to Yoshinori Tomoyasu's visit ( <b>Miami University</b> ). Hosts: Maja Adamska ( <b>ANU</b> ) and Hermes Escalona and Adam Slipinski ( <b>CSIRO</b> ). CBA funding: Flights (\$2,555) and accommodation (\$1,830).
Feb 2020	Stevens, A.V., Nicotra, A.B., Godfree, R.C. and Guja, L.K. (2020), Polyploidy affects the seed, dormancy and seedling characteristics of a perennial grass, conferring an advantage in stressful climates. <i>Plant Biol J</i> , 22: 500-513	Publication	Student Project: Lydia Guja, Robert Godfree, <b>CSIRO</b> ; Adrienne Nicotra, Amelia Stevens (RSB Hons student), <b>ANU</b>
Mar 2020	<a href="#">Bayesian molecular clock-dating of phylogenies: fossils, genomes and uncertainty</a>  <a href="#">Bayesian molecular clock dating using genome-scale datasets</a>	Visiting Scientist Seminar & Workshop	CBA contribution to Mario dos Reis, visit ( <b>Queen Mary University of London</b> ). Hosts: Hermes Escalona, Adam Slipinski (Australian National Insect Collection, <b>CSIRO</b> ) and Minh Bui (Research School of Computer Science, <b>ANU</b> ). CBA funding: Flights (\$1,434) and accommodation (\$895).
Apr 2020	<a href="#">Spatial genetics in fire-ground fauna</a>	Workshop (online)	CBA facilitated workshop - initial expert assessment to provide a rapid assessment of the extent of genetic divergence across faunal populations in fire-affected areas. Craig Moritz, Scott Keogh, Linda Neaves, Anna MacDonald, Emily Roycroft, Mitzy Pepper ( <b>ANU</b> ), Sarah Legge (ANU/ <b>UQLD</b> ), Peter Unmack, Bernd Gruber, Arthur Georges ( <b>U Canberra</b> ), Michael Mahony ( <b>U Newcastle</b> ), Renee Catullo ( <b>UWA</b> ), Katherine Farquharson ( <b>U Sydney</b> ), Andrew Baker ( <b>QUT</b> ), Paul Oliver ( <b>Griffith</b> ), David Chapple ( <b>Monash</b> ), Conrad Hoskin ( <b>JCU</b> ), Sam Banks ( <b>CDU</b> ), Leo Joseph, Simon Ferrier ( <b>CSIRO</b> ), Steve Donnellan ( <b>SA Museum</b> ), Mark

Date	Activity	Type	Notes
			Eldridge, Jodi Rowley ( <b>Aust Museum</b> ), Kevin Rowe, Joanna Sumner, Jane Melville, Maggie Haines ( <b>Museums VIC</b> ), Jason Bragg ( <b>RBG Sydney</b> ), Jennifer Pierson ( <b>ACT Gov</b> ), Sophie Mazard ( <b>Bioplatforms Australia</b> ).
Apr 2020	Bioplatforms Australia <a href="#">Australian Amphibian and Reptile Genomics</a> initiative	Research collaboration	Co-led by CBA Director Craig Moritz ( <b>ANU</b> ) and Arthur Georges ( <b>U Canberra</b> ). CBA co-contribution: \$20K pa for 3 yrs.
Apr 2020	Apirajkamol, N(B), et al. 2020. Oxidative stress delays development and alters gene expression in the agricultural pest moth, <i>Helicoverpa armigera</i> . <i>Ecol Evol.</i> 10: 5680– 5693	Publication	Student Project: Telomere length as a biomarker for stress in an Australian pest moth
Apr 2020	von Takach Dukai, B., Peakall, R., Lindenmayer, D.B. et al. 2020. The influence of fire and silvicultural practices on the landscape-scale genetic structure of an Australian foundation tree species. <i>Conserv Genet</i> 21, 231–246.	Publication	Ignition Project: Genetic and demographic impacts of contemporary disturbance regimes in Mountain Ash forests
May 2020	<a href="#">EcoKDDart: Future Proofing Biodiversity and Biosecurity with a novel integrative Big Data Analysis Hub</a>	Research collaboration; external funding	\$1.2M awarded to <b>U Canberra</b> , <b>ANU</b> and Diversity Arrays Technology ( <b>DArT</b> ) by the <b>ACT Government</b> Priority Investment Program (PIP). Funded by the ACT Government Priority Investment Program (\$1.2M). CBA will coordinate and deliver engagement and training workshops and a mini grant scheme (to enable beta-testing of the platform).
Jun 2020	CBA <a href="#">renewed</a> for a further 5 years and new Umbrella Agreement signed	Internal and external funding	Contributions from <b>ANU</b> (Research School of Biology, Fenner School of Environment and Society, College of Science & DVCR), <b>CSIRO</b> (National Research Collections Australia and Health & Biosecurity), and the <b>University of Canberra</b> (Centre for Conservation Ecology and Genetics). As part of the renewal, the ANU-based <a href="#">Ecogenomics and Bioinformatics Lab (EBL)</a> came under the umbrella of the CBA.
July 2020	Liaison Committee Meeting	Meeting (online)	
Aug 2020	<a href="#">Policy Impact Masterclass</a>	Workshop (online)	In collaboration with ANU's <b>Public Policy &amp; Societal Impact Hub</b> .
Aug 2020	Shanmuganandam, S., et al. 2020. Uncovering the microbiome of invasive sympatric European brown hares and European rabbits in Australia. <i>PeerJ</i> doi: <a href="https://doi.org/10.7717/peerj.9564">10.7717/peerj.9564</a>	Publication	Ignition Project: <a href="#">Uncovering the hare microbiome</a>

Date	Activity	Type	Notes
Sep 2020	<a href="#">Humboldt Day evolutionary biogeography symposium</a>	Symposium (online)	Part of the <b>International Biogeography Society (IBS)</b> inaugural International Humboldt Day commemorations. Speakers: Craig Moritz, Veronica Briceno Rodriguez, Onoriode Coast, Adrienne Nicotra, Ian Brennan Emily Roycroft, Audrey Prasetya, Alex Skeels, Marcel Cardillo ( <b>ANU</b> ), Paul Oliver ( <b>Griffith/QLD Museum</b> ), Andrew Hugall, Kevin Rowe ( <b>Museums VIC</b> ), Elizabeth Joyce and Darren Crayn ( <b>JCU/ATH</b> ).
Oct 2020	<a href="#">Genetic Diversity - Australian Indicators Forum</a>	Workshop (in person & online)	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	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.

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

Project	Update (provided by grant recipients)
Using expert elicitation to identify impacts of climate change on Australian species (Mar 2019)  Adrienne Nicotra, Rachel Slatyer, Sonya Geange (RSB, ANU), Lydia Guja (CSIRO/ANBG), Dave Albrecht, Sam Andrew (ANH, CSIRO) + participants from NSW Office of Environment and Heritage, Sydney Botanic Gardens, Dept of Environment, and several other agencies and universities.	We have been delayed by 2020 writ large, but are none the less progressing steadily on this project. We developed a basic version of our interface which got most positive responses from the participants in our expert elicitation exercises. We are now proposing to enhance the initial interface so that it can be customisable. We're entering into a collaboration with the CEBRA at UoM to support this work. The plan is to engage IT company Lightning Rock to do the enhancements and to trial them with a further elicitation exercise with our experts in the Adaptive Capacity of plants from Threatened Ecological Communities in the latter half of this year. We have also been approached by several other groups to develop elicitation exercises for them – so this beast seems to be gaining momentum of its own.

Project	Update (provided by grant recipients)
	<p>And, our first paper on this method has just been accepted (yesterday) in <i>Global Change Biology</i>.</p> <p>The results from the case study, which elicited judgements from experts on adaptive capacity of Australian desert and temperate plants to climate change are, discussed here:  <a href="https://www.youtube.com/watch?v=Iz4B1asioOI">https://www.youtube.com/watch?v=Iz4B1asioOI</a></p>
<p>Genomic empowerment of Australian bee systematics, taxonomy, conservation and diversity (Mar 2019)</p> <p>Juanita Rodriguez, Olivia Evangelista (ANIC, CSIRO), Francisco Encinas-Viso (ANH, CSIRO), Saul Cunningham, Julian Brown (Fenner, ANU), Sasha Mikeyev (RSB, ANU), Simon Tierney, Olivia Bernauer, Laura Brettell (HIE, Western Sydney), Katja Hogendoorn (WAI, Adelaide), Michael Schwarz (Flinders), Tobias Smith (Queensland), Remko Leijts (SA Museum), Terry Houston (WA Museum), Ken Walker (Mus Vic) Michael Batley (Aust Mus), Eduardo Almeida (University of Sao Paulo), Sydney Cameron (Illinois at Urbana-Champaign), Bryan Danforth (Cornell), Laurence Packer (York), Romina Rader (New England), Sandra Rehan (New Hampshire).</p>	<p>During the Australian Native Bee Conference held in Brisbane in December 2019, native-bee researchers from around Australia held a working group to explore the use of genomic data for Australian bee taxonomy, pollination, evolutionary ecology and conservation.</p> <p>The working group was funded by the Centre for Biodiversity Analysis, CSIRO and the Hawkesbury Institute for the Environment (Western Sydney University), and was organised by Simon Tierney (WSU), Saul Cunningham (ANU) and Juanita Rodriguez (CSIRO). As a result of the working group, the Australian Native Bee Genomics Synthesis Group was created.</p> <p>The main goal of this synthesis group was to facilitate an assessment on the status of our knowledge on Australian bee taxonomy, diversity and genomics and to create an action plan that will allow Australian researchers to reach the goal of a unified “bee dataset” including diversity, plant-pollinator interactions, spatial patterns, and molecular resources.</p>
<p>What do humans and insects have in common? Using advances in human genetics to understand insecticide resistance in the cotton bollworm, <i>Helicoverpa armigera</i> (Mar 2019)</p> <p>Amanda Padovan, Tom Walsh (L&amp;W, CSIRO), Dan Andrews (JCSMR, ANU), Angela McGaughran, Andy Bachler (PhD student) (E&amp;E, RSB, ANU).</p>	<p>Contract not fully executed until March 2020 and then lab work has been delayed due to COVID. ANU-CSIRO PhD student Andy Bachler will undertake this project (and has received a CSIRO PhD top-up scholarship).</p>
<p>The role of honey bee microbiome evolution in adaptation to environmental stress (Mar 2019)</p> <p>Student project. Alexander Mikheyev (E&amp;E, RSB, ANU), Amy Paten (L&amp;W, CSIRO), Vienna Kowallik (OIST), Kiera O’Halloran (Honours student, RSB, ANU).</p>	<p>No update provided</p>

Project	Update (provided by grant recipients)
<p>Building a reference genome for a non-model species: <i>Wahlenbergia ceracea</i> (Mar 2019)</p> <p>Student project. Rocco Notarnicola (E&amp;E, ANU PhD student), Loeske Kruuk (E&amp;E, RSB, ANU), Benjamin Schwessinger, Diep Ganguly (PS, RSB, ANU), Alexander Schmidt-Lebuhn (ANH, NRCA, CSIRO).</p>	<p>Jemimah H (Honours student) has been recruited to the project, however lab work has been delayed due to COVID. PacBio sequencing of <i>Wahlenbergia ceracea</i> commenced in March.</p>
<p>Barcoding and capture-based approaches for eggshell genomics to improve biodiversity assessment in Australian birds (Mar 2019)</p> <p>Alicia Greal, Naomi Langmore (E&amp;E, RSB, ANU), Clare Holleley (ANWC, CSIRO).</p>	<p>The first manuscript from this work has just been accepted in Scientific Reports, and a second led by Naomi and integrated with a large project is being drafted. This Ignition grant added considerable value to the ARC work and stimulated further collaborations.</p>
<p>Can environmental selection on physiological phenotypes help explain the success of invasive species in Australian rainbowfishes? (Mar 2019)</p> <p>Peter Unmack (IAE, UC), Chris Fulton (E&amp;E, RSB, ANU).</p>	<p>We've had some holdups with our ignition grant progress, due to covid-19 and Chris Fulton on leave. Perhaps given the uncertainty we would like to request an extension of the project to the end of 2021. We have purchased 3 GoPro cameras with USB cables for online tracking of fish activity – these are at UC.</p>
<p>Arbovirus surveillance: Invertebrate-borne viruses as biocontrol agents (Mar 2019)</p> <p>Leon Court, Chris Hardy, Matthew Morgan (L&amp;W, CSIRO), Michael Frese (IAE, UC). CBA funding: \$9,000</p>	<p>No update provided</p>
<p>Developing DNA-based non-invasive population monitoring for the threatened Broad-toothed Rat to assist in threat management outcomes (Mar 2019)</p> <p>Stephen Sarre, Cat Campbell (IAE, UC), Wendy Ruscoe (Health and Biosecurity, CSIRO), Mel Schroder (NSW-NPWS).</p>	<p>The project has been delayed by the 2019-2020 fires occurring in the study area, COVID lockdowns and restrictions, illness amongst the team, and technical difficulties genotyping scat samples. We are requesting an extension to this project to enable us to access the funds remaining and complete the sampling and sequencing.</p>