

Australian Guide to Running a **BioBlitz**



BioBlitz
AUSTRALIA



BioBlitzers off to survey at the Oaklands Wetland BioBlitz

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ALL OF US WHO HAVE RUN A BIOBLITZ AGREE THEY ARE JUST THE BEST WAY TO HAVE FUN, EXPLORE AND LEARN TOGETHER IN SPECIAL PLACES AND THEY ARE DEFINITELY WORTH THE HARD WORK OF ORGANISING THEM.



Invertebrate survey at World Parks Congress BioBlitz, Suzanne Dunford

Foreword



Reptile survey at ACT Centenary BioBlitz, Libby Hepburn

Australia's terrestrial and marine ecosystems are celebrated "hot spots" for biodiversity, with a large proportion of our animal and plant species unique to our continent and waters. Yet much of this distinct flora and fauna remains unknown. Scientists estimate that as many as three in four species remain undiscovered or undescribed.

With Australia's biodiversity at risk from many pressures – such as habitat destruction, overexploitation, climate change, and introduced species – we are challenged to learn more about our ecosystems so we can better protect and manage them. We need scientists from many disciplines, but it can't just be scientists alone. We need the help of the entire community to rise to the magnitude of the task. Citizen science programs like BioBlitzes are vital connecting links.

These initiatives increase public interest and involvement in science on a national scale. They provide opportunities for families to engage in science in ways that nurture children's interest, and allow everyone to experience and enjoy science as it is practised. They encourage science engagement and literacy through practical learning alongside experts. They help produce valuable and much-needed biodiversity data more widely and thoroughly than scientists could manage alone.

Science isn't just something scientists do. It is something in which every single one of us has a stake. Through a BioBlitz we can all have a role - working, enjoying our world, and learning about its natural wonders together. I welcome this BioBlitz guide and encourage everyone to get involved in science. You might even discover a new species.

PROFESSOR IAN CHUBB AC
Chief Scientist for Australia



Reptile survey, skink at Panboola BioBlitz, Ross Mannell



Acknowledgements

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Contributors to the Guide have all run or been involved in BioBlitzes using this model all across Australia. These are: Libby Hepburn (leader of the Australian Bioblitz Guidelines working group), Patrick Tegart, Stephanie von Gavel, Philip Roetman, Sam Niedra, Erin Roger, Suzanne Miller, Theresa Fyffe, Peter Brenton, Christine Lambkin. Proofreading - Angelika Erpic, and Graphic Design - Holly Webber.

WE WOULD LIKE TO THANK THE FOLLOWING ORGANISATIONS FOR THEIR SUPPORT IN THE PRODUCTION OF THE GUIDE.





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GOOD SCIENCE IS DONE BY
BEING CURIOUS IN GENERAL,
BY ASKING QUESTIONS ALL
AROUND, BY ACKNOWLEDGING
THE LIKELIHOOD OF BEING
WRONG AND TAKING THIS IN
GOOD HUMOR, BY HAVING A
DEEP FONDNESS FOR NATURE,
AND BY BEING MADE JUMPY
AND NERVOUS BY IGNORANCE.

LEWIS THOMAS



About this Guide

This first Australian Guide to Running a BioBlitz (the Guide) has been designed to encourage and support those who wish to run BioBlitzes in Australia.



BioBlitzes are fun, engaging and deliver meaningful outcomes to individuals and organisations but they are also complex and multifaceted events. To be effective, the event's processes and management need to be considered and planned before undertaking your own first BioBlitz.

This Guide is designed for Australia and is based on the experiences of BioBlitz organisers in Australia and overseas. It is based on the UK model developed as part of the Open Air Laboratories (OPAL www.opalexplornature.org) program which was updated in the latest "Guide to Running a BioBlitz 2.0".

The Guide will help you plan and manage successful BioBlitz events from 100 to 1000 participants. Use and adapt aspects of the Guide relevant to your circumstances.

This Guide looks at a BioBlitz from two organising perspectives:

- **the science** – ensuring good science happens to capture a valuable snapshot of the biodiversity at your location - see the BioBlitz Science section
- **the event** - ensuring success of the event through good planning and management – see the BioBlitz Event Management section

In this Guide and its appendices we offer a planning framework, useful ideas, advice, examples, checklists, resources and online links.

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Resources

More detailed information, case studies and resources to supplement the main aspects of this Guide.

Our aim is that this Guide is spread far and wide. It is freely distributed under a Creative Commons-Attribution licence (CC-BY). The Guide should be cited as: The Australian Guide to Running a BioBlitz (2015): Hepburn L; Tegart P, Roetman P, von Gavel S, Niedra S, Roger E, Miller S, Fyffe T, Brenton P, Lambkin C.

This Guide is a living document which we expect will be developed and improved for both science and the community over time as practitioners gain experience and understanding, and share their learning.



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Caterpillar and wattle at Woomargama BioBlitz, Patricia Styche



What is a BioBlitz?

- A BioBlitz is a festival of science in nature which, if well organised, is fun, enjoyable and meaningful to the community, naturalists, scientists and organisations alike.
- A BioBlitz is an opportunity to share expertise and enthusiasm for nature. It encourages the development of science and nature engagement and literacy as everyone works together.
- A BioBlitz is namely a type of citizen science i.e. scientific projects where the public actively participate with scientists to conduct research and record their findings. Through an event such as a BioBlitz, communities can together create a significant resource of biodiversity data in their local area and across Australia.
- A BioBlitz is all about collaboration, organisation and a diversity of skills to create a successful event - you need organisers, event managers, volunteers, scientists and naturalists, community leaders, organisations and most of all the public.

There are a growing number of BioBlitz activities across Australia – some examples are highlighted throughout this document with a list and more detailed case studies in the Resources section of the Guide. Before you start remember the best thing you can do is - research, research, research! You will gain much from following references in the Guide, actively searching the internet for other BioBlitzes and speaking to people who have already run them.



BIO = LIFE
BLITZ = TO DO
SOMETHING QUICKLY
AND INTENSIVELY.

A '**BIOBLITZ**' IS A CONCERTED EFFORT TO DISCOVER AND RECORD AS MANY LIVING THINGS AS POSSIBLE WITHIN A SET LOCATION OVER A LIMITED TIME PERIOD (USUALLY 24 TO 36 HOURS).



Sundew at Woomargama BioBlitz, Karen Retra



Koala scat survey at Mimoso Rocks BioBlitz

Why run a BioBlitz?

Will a BioBlitz meet your goals? This is the first question that should be asked. From an organiser's perspective, the BioBlitz concept is very flexible and can be designed to fit specific budgets, aims and interests.

If planned carefully, your BioBlitz will be an effective way to showcase, explore and raise awareness of the diversity of life in a particular area, launch projects or partnerships, spread your message to a wide audience, recruit new members and develop networks of shared interest. BioBlitz events are also a lot of fun.

At the outset, consider what outcomes you and any partner organisations are hoping for and design the event accordingly, remembering that it is important to evaluate the event to measure the extent to which your outcomes were achieved. Legacies should include:

Scientific & environmental outcomes

- The main scientific aim of a BioBlitz is to generate or extend biodiversity data at the chosen location. BioBlitzes cannot be complete biological surveys but they do



create significant species lists and have facilitated the discovery of new species, the rediscovery of rare species and the identification of species where they are not usually found.

- Through recording the names and locations of species, a BioBlitz can generate biological species' records that can be used to help scientific research as well as to inform conservation practice and policy, local planning and land management on a variety of scales.

Individual outcomes

- Public participants can gain: enjoyment and inspiration in a natural and social setting; knowledge and understanding of local wildlife, habitats and ecology; skills in wildlife identification and biological recording; awareness of and improved attitudes towards wildlife,

science and conservation efforts in the local area; behavioural change as they are encouraged to participate; and even improvements in wellbeing.

- It is also important to recognise the individual outcomes for the scientists and naturalists involved in a BioBlitz. The enjoyment, satisfaction and invigoration derived from sharing knowledge and working with enthusiastic and eager-to-learn members of the public is commonly witnessed among, and reported by, survey leaders. BioBlitzes also provide a networking and socialising opportunity for survey leaders, and an opportunity for them to hone science communication skills and to add species records for the location.

Community outcomes

- By engaging with local communities on their own 'patch', BioBlitz events can lower barriers to engagement with nature and science and build support for local conservation activities. They can also bring together diverse groups of people from the community, contributing to improved social cohesion and communities of practice.

Organisation outcomes

- BioBlitzes can help to raise the profile of participating organisations by generating support to meet their aims, either directly through membership recruitment or through networking. They may also generate financial support and help to leverage future funding.
- BioBlitzes can also create a platform for collaboration and a network of interested and engaged individuals and organisations who may well be happy to be involved in your next BioBlitz, project or research opportunity.



Insect identifying at
Panboola BioBlitz

BERMAGUI BIOBLITZ SURVEY DESCRIPTIONS & SURVEY

In joining, note the numbers, then look at the timetable to see the details and times. When you are done, email us at bermagui@ecology.org.au with your name and contact details. We will email you a confirmation of your registration.

Planning a BioBlitz – an overview

To be successful, a BioBlitz must have a range of well-organised surveys and other science learning activities, and needs to be carefully thought out and planned with the help of a lot of good people.

We have found it helps in planning, gathering resources and managing the event, to separate the science activities and the event planning. The following sections - "BioBlitz Science" and "BioBlitz Event Management" - follow this structure.

A BioBlitz needs to be planned thoroughly from conception to celebration:

- **Before** - plan your event including your location, timing, team, resources, approvals and promotion
- **During** - execute your plan and manage contingencies during the BioBlitz
- **After** - complete the identification work, evaluate, report and celebrate your BioBlitz with your team and community.
- **Legacy** - with your records and evaluations, think about their value and use and the benefits, skills and networks that have been created by the whole event. Consider what next with your BioBlitz community?

BERMAGUI BIOBLITZ – TIMETABLE FRIDAY MARCH 30

(Please meet in the BASECAMP MARQUEE to R before the start time of the survey)

HIGH TIDE	02:38	1:48M
LOW TIDE	08:38	0:44M
HIGH TIDE	15:22	1:10M
LOW TIDE	20:57	9:75M

ACTIVITY	LEADER	TIME
8-10	Dr. Jim Shields, Rob Hamilton, Dan Hamilton, Ken Woolhouse	8-10
08:45 - all day	Elisabeth Larsen, Les Staff, Jackie Miles	08:45 - all day
09:00 - all day	Tony Hastings	09:00 - all day
08:45 set up, trapping to 11:00	Dr. Jim Shields, Tom Gorman, Elisabeth Larsen, Ken Woolhouse	08:45 set up, trapping to 11:00

09:00 - 13:00	Dr. Jim Shields, Sue Swenson, Robin Kestry	09:00 - 13:00
09:00 - all day	Tony Jarman, Terry Leiper, Colin Gould, Ross Lauricella, Storey	09:00 - all day

09:30 set up traps		09:30 set up traps
09:30 to 11:30		09:30 to 11:30
09:30 to 12:00		09:30 to 12:00

10:00 - 11:00		10:00 - 11:00
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10:00 - 11:00		10:00 - 11:00



The following is a planning checklist that provides an overview of what is entailed in organising a successful BioBlitz. It sets out some of the major activities for a BioBlitz involving about 300 people.

It is critical to plan the BioBlitz as far in advance as possible – 12 months out would not be too early!

Preliminary planning





- ✓ Meet with individuals, groups and organisations (including local naturalists and scientists), who may be interested in contributing, to scope ideas, support, and requirements.  
- ✓ Determine what management structure will work best for your event. Will one person take the role of coordinator or will the role be split across specific areas of responsibility? e.g. the what (scientific surveys), the how (event management) and the who (participants). 
- ✓ After checking for conservation restrictions that may limit activities, choose a site and secure permission/s to access and survey. 
- ✓ Consider and agree the date and duration and start to plan the event structure and content. 
- ✓ Develop a budget and seek additional funding or sponsorship as required. 
- ✓ Check the Australian Citizen Science Association (www.citizenscience.org.au), Atlas of Life (www.alcw.org.au) and/or Atlas of Living Australia (www.ala.org.au) websites for resources and talk directly with others who have organised a BioBlitz to get their advice.



The little icons indicate where further information is available, either in this Guide or on the websites listed.



In the six months leading up to the event

- ✓ Invite specific naturalists, scientists and volunteers to participate.
- ✓ Decide on the layout of the venue, including the design of your Basecamp and data capture methods, and prepare recording sheets and a records database. 
- ✓ Arrange site facilities e.g. parking, catering, toilets, any necessary licenses (e.g. a Development Application (DA) may be required from your local Council for vending, collecting specimens etc), on-site security and marshalling (if required), and first aid requirements and insurance. 
- ✓ Begin the process of obtaining necessary approvals and permissions for the surveys you wish to undertake from the landowner/s and relevant licensing authorities.
- ✓ Decide on and book any equipment you need to hire – marquee, generator, tables & chairs.
- ✓ Plan and develop all BioBlitz activities with your teams.
- ✓ Ensure that survey leaders give you agreed detailed descriptions of their surveys including methodologies, times, location, numbers and risk assessments.  



- ✓ Write risk assessments and other policy documents.
- ✓ Create a timetable of all activities.
- ✓ Establish a booking system for surveys and Basecamp activities e.g. Eventbrite.
- ✓ Make a list of local accommodation, eateries and other useful information.
- ✓ Prepare and circulate relevant information packs for volunteers, participants and survey leaders.
- ✓ Plan how you will evaluate the success of the event.
- ✓ Develop a communications plan and continue to communicate with your partner organisations and individuals.
- ✓ Design and order signs, banners and Tshirts, design and print programs for the public (if required).
- ✓ Circulate publicity material and press releases; contact local community groups and tourist offices.
- ✓ Write/update web pages including those of partner organisations; set up blogs and other online media such as Facebook and Twitter.
- ✓ Check everything you need is prepared.
- ✓ Confirm and put in place the requested support needs of survey leaders.
- ✓ Run training and/or briefing sessions for key staff and volunteers. Clarify everyone's roles at the event. Provide information about key locations, event context and what to do in an emergency electronically and in hard copy.
- ✓ Carry out a final publicity push, which could include social media, posters in the local area and local radio and television interviews/shows.

During the event (and at set up)

- ✓ Co-ordinate delivery and set up of hired equipment.
- ✓ Set up your site, including Basecamp and activities.
- ✓ Walk the venue to check for any new risks (and exciting wildlife!).
- ✓ Brief staff and volunteers, and inspire enthusiasm in your team.
- ✓ Talk to the media and update websites and social media.
- ✓ Be active and dynamic: if something isn't working, change it.
- ✓ Evaluate the success of sessions progressively, and also each day's activities in total.

The weeks before

- ✓ Inform the local council, police, and relevant emergency services of your event.
- ✓ Re-confirm bookings for hired items.



Waterbug survey at World Parks Congress BioBlitz,
Rick Stevens © Sydney Olympic Park Authority.
Image courtesy of SOPA.



After the event

- ✓ Clean up the site.
- ✓ De-brief participants: gather feedback, totals and achievements.
- ✓ Thank and acknowledge landowner/s, special guests and everyone who contributed.
- ✓ Write up your evaluation and consider lessons learned.
- ✓ Collate survey results and remind participants to send in their records and photos.
- ✓ Write final event report, share results/reports and feedback.
- ✓ Feed relevant findings into future site management practices.
- ✓ Follow up and share any interesting scientific stories.
- ✓ Relax and recover.
- ✓ Celebrate your BioBlitz with an exhibition about a month after the event.

Legacy

- ✓ Consider and record the range of outcomes from your BioBlitz.
- ✓ Consider how your data, newly developed experience and capabilities could be built on in the future with your enhanced networks and partnerships.



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WHEN YOU HAVE
SEEN ONE ANT, ONE
BIRD, ONE TREE,
YOU HAVE NOT
SEEN THEM ALL.”

E. O. WILSON





BioBlitz Science

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Elisabeth Larsen small mammal ID at Bermagui BioBlitz, Martin Ollman



SCIENCE IS AT THE HEART OF A BIOBLITZ. A BIOBLITZ IS ALWAYS ENGAGING AND ENJOYABLE BUT TO MAKE IT WORTH EVERYONE'S EFFORTS AND WORTH REPEATING, THE SCIENCE UNDERTAKEN NEEDS TO BE VALID AND WELL-ORGANISED. BIOLOGICAL SURVEYS ARE THE CORE SCIENCE ACTIVITY OF A BIOBLITZ.

Survey leaders

Invite the best local naturalists and scientists who can offer expertise across the widest possible range of species to be found at your chosen location. They will be the survey leaders at your BioBlitz.

- Aim to recruit a range of survey leaders to enable a wide range of surveys, boosting your final species tally, and engaging a wide audience.
- Work with your survey leaders to decide what sort of surveys to run, what data will be collected and how surveys can be conducted at the BioBlitz site. This might include guided and self-guided surveys, and possibly night and also special interest group surveys (such as scuba and snorkel).
- Often local naturalists will have the deepest knowledge of what might be living in your chosen location and how to find species in different habitats. Early conversations with selected survey leaders should gather information about the selected BioBlitz site, whether there has been any previous research in the area and any key aims for the BioBlitz.
- It is also important to support your survey leaders before and during the BioBlitz through regular information sharing.



Surveys

The range of surveys you offer will be determined by:

- the scientific value, ecological possibilities and access of the location
- the expertise of the available survey leaders
- species groups and survey techniques chosen to engage a wide audience
- obtaining a valid and useful range of biodiversity records and data
- the licences and permissions obtained.

Following are some ideas and tips for surveys and other activities to ensure you get the most science and engagement out of your BioBlitz.

Permissions and licences

- Obtain permission from the landowner/s (public or private) to hold the BioBlitz on their land. For protected sites contact the relevant statutory body.
- If the site includes Indigenous owned, controlled or managed land ensure proper communication, consultation and that the appropriate permissions are obtained from Indigenous representatives – e.g. Aboriginal Land Council, Elders group.
- No collecting or intrusive surveying should be undertaken by untrained and unqualified people unless they are working under the direct supervision of an accredited expert. Ethics approval is needed if your surveys require handling and/or trapping of vertebrates (e.g. birds, mammals).
- Collecting or surveying permits are required for many species and some habitats so seek advice where necessary. Some BioBlitz organisers employ one key ecologist who has all the necessary licences for surveys. Other survey leaders may have the specialist licences necessary for whatever they are intending to survey. If unsure about permits, licences and ethics, speak to your local council, Natural Resource Managers (NRMS) and scientists.

Case Study

SPECIAL EXPERTISE

Your aim is to have as wide a range of surveys as possible, so look for expertise already in your area to help. At the Bermagui BioBlitz we invited our pals from Reef Life Survey (RLS) to join us. They undertook their regular survey for RLS and then explored the area to find as many species as they could to help our tally! We didn't have insurance to cover scuba diving, so it was great that they already had their own.



Pictured above

Reef Life Survey at Bermagui BioBlitz, Bill Barker



Case Study

DATA HANDLING LESSONS AT THE DISCOVERY CIRCLE BIOBLITZES IN ADELAIDE 2014

For data collection, the Discovery Circle has a portal integrated with the Atlas of Living Australia. Through that portal, each biological survey had a pre-prepared electronic form, with relevant questions for the species being surveyed (based on survey forms used for biological monitoring in South Australia). Photos, a GPS location and additional notes could also be added. Each survey leader was accompanied by a data-entry volunteer who carried a tablet to enter data directly into the web interface. The tablets operated on the 4G network and we utilised inbuilt GPS and camera features. Using this system, we were able to display most survey results 'live' at the Basecamp,

with a laptop computer and projector, and online.

Around 450 people attended each BioBlitz, recording 577 species sightings. You can see the results at www.discoverycircle.org.au.

We plan to improve the data-entry system with our 2015 BioBlitzes, adding a photographer to each survey. We found that tablets were not ideal for taking photos, and data entry left little time for photography, so these volunteers will carry digital cameras. The photographs will be added to the survey records via Bluetooth or matched with survey records and uploaded at Basecamp after each survey.



Pictured above Fish surveys at the Oaklands Wetland BioBlitz

Survey data & recording

- The data you gather is an important legacy of a BioBlitz so consider now, what the data collected from your survey might be used in order to maximise the value of the BioBlitz for scientific and land management purposes.
- BioBlitz surveys could provide 'baseline' data, an 'update' to check the status of a locally threatened or pest species, or help increase understanding of populations as static, moving range, increasing or decreasing. If the same site is surveyed again over time (regular BioBlitzes) the scientific value of the data is much greater. Discuss possibilities with your partner organisations and see if there are any species groups of special interest or gaps in data that your BioBlitz might fill.
- You can collect data using paper and pencil, cameras and directly via various online apps and websites. Your survey leaders may have a

preferred method. The end point for the data you collect should be the Atlas of Living Australia (ALA) which is the national biodiversity database. The Resources section has some more detailed information on data recording.

- Explain to participants how you intend to use the records so they know where the data will end up and how it will be shared. They will be interested to see their data being used and to learn that when the data is added to ALA, the wider public and scientific community can view, download and use what has been recorded at their BioBlitz.
- Remember to get the appropriate copyright permissions for any survey photos taken by participants - preferably a Creative Commons-Attribution (CC-BY) or Creative Commons-Public Domain (CC0) licence – so you can use and share the photos in the future. This can most easily be done as part of your registration process.



Case Study

TRACKS, SCATS & TRACES

You can find out a lot about species in your chosen location if you look at the small things. You may not see the animal, but if you have an expert to help you, you may discover much more than you thought. For instance there's more than one way to find a possum! Possum traces were found during the 'tracks and traces' survey at the Discovery Circle BioBlitz at Harry Bowey Reserve in 2014.

In Bega Valley NSW there are a few remnant populations of koala. Following a sighting of a koala crossing the road in an area where they had not previously been seen it was decided to undertake some koala scat surveys during the Mimosa Rocks BioBlitz. Nine surveys were undertaken – an international visitor most excited that she would be counting, "1 koala, 2 koalas, 3 koalas in the trees" not realizing the survey meant a few hours crawling around the base of trees looking for elusive koala "poop". With no success all during the BioBlitz, and waiting for the last two surveys to return, our koala teams (with our international visitor) hit the jackpot - each finding koala scat and verifying koalas in a previously unknown location!



Pictured above Tracks and traces at the Harry Bowey Reserve BioBlitz

Guided surveys

Here are a few ideas for guided surveys directed by a survey leader.

- Observational walks (or 'expeditions') for a variety of species form the main types of surveys undertaken - birds, fungi, plants, and mammal tracks and traces (e.g. koala scat). Survey leaders may wish to use pre-prepared lists of known species for the area (these can be created from the ALA).
- Consider different survey techniques such as: spotlighting, light-trapping of moths, motion sensitive camera traps, acoustic recording of bats and frogs.
- Setting and checking of traps such as Elliot traps, pitfalls, cage traps, fish traps, hair tubes and sand traps.
- Many surveys can be successfully repeated throughout the event so participants coming to the Bioblitz at different times get a range of surveys from which to choose.

TIPS FOR WILDLIFE SURVEYS

Work to the skills of those present and the habitats and species available.

Ask the survey leader how many participants they are happy to work with and whether they will need help (i.e. survey assistant, recorder, photographer).

For multiple surveys covering the same taxonomic groups (e.g. birds, reptiles etc), plan to cover different areas over the course of the BioBlitz.

It is important to note sunrise and sunset times, especially when organising dawn and nocturnal surveys.

In coastal locations, consider tide times to determine when certain surveys must take place. Your schedule needs to have room for flexibility.

For coastal events, dive and snorkel surveys can add greatly to survey data. Engage with local dive clubs and marine societies. If possible arrange for divers/snorkelers to show photos and videos back at Basecamp.



Self-guided surveys

Self-guided activities can help collect further species records and engage participants between collaborative survey activities. Make sure you consider the safety of the participants and any ethical issues related to observing or sampling living organisms. Your risk assessment and animal ethics approval will also need to cover self-guided activities. Consider the following:

- Recording forms and maps can be given to knowledgeable participants to make their own records.
- Consider that survey leaders might like to do some 'solo surveying' as it is often difficult to lead a group and record wildlife simultaneously. Rotating shifts or including a few surveys which are closed to the public can work well. Survey leaders may also wish to go on surveys other than their own.
- Data recording apps allow participants to create their own list of sightings and add to the overall BioBlitz records. Suggested web portals and smart-phone applications: the Atlas of Living Australia (OzAtlas app), iNaturalist app and Bowerbird website.
- You may arrange for some specialists to be available to help identify online recorded species during and after the BioBlitz.
- Consider offering participants 'missions' to find different species and artefacts that can be identified by an expert back at Basecamp: for example, shells, feathers, leaves, nuts.
- Ask participants to photograph what they find and bring their images to Basecamp where they can either be identified or uploaded for later identification. Remember you should have a signed photo-use consent (part of the Registration form) as you might want to re-use images.
- Create a nature trail around the site with printed 'spotter sheets' of target species to look for e.g. "Top Five" or "Hunt for Alien Invaders".
- Safety is paramount for self-guided surveys. Choosing easily accessible habitats and walking tracks can help minimise any injury to participants, or impacts on or wildlife.



Case Study

CAMERA TRAPS – GOTCHA!

Using motion sensitive cameras captures some nocturnal animals that are usually very hard to see and the sneaky things they get up to. It is also a non-intrusive method of surveying.



Motion sensitive camera shots, Common Brushtail Possums (*Trichosurus vulpecula*) at Mimosa Rocks BioBlitz, Olivia Forge



Motion sensitive camera shots, long-nosed bandicoot (*Perameles nasuta*) at Mimosa Rocks BioBlitz, Olivia Forge



Case Study

ACTION IN THE NIGHT

Night time at a BioBlitz is probably the most different experience for most participants. To go out at night with an expert and see lots of creatures which are hidden in daylight is exciting and illuminating. At Panboola Bioblitz we took people around the wetlands to look for frogs.

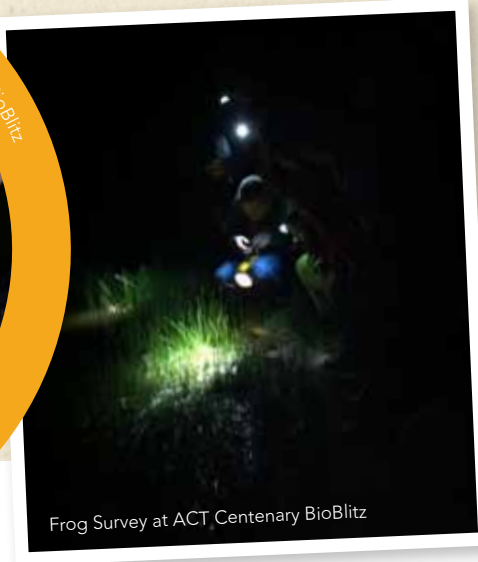


Moth hunt at Oaklands Wetland BioBlitz

Moth attracting is also great fun as different species turn up at different times of the night.


Night rocky shore rambles at Bermagui BioBlitz and night time snorkeling were also great favourites - you can see much more action at night. We kept a strict signing in and out of surveys and increased support for night time activities.

Frog survey at ACT Centenary BioBlitz



Frog Survey at ACT Centenary BioBlitz

After-dark guided surveys

Night surveys for wildlife such as possums, bats, moths and frogs, are among the most exciting activities at a BioBlitz but they need careful planning as they bring with them additional health and safety risks.  Some may be best left to only survey leaders and skilled volunteers or strictly limit public numbers. Ensure that you contact any relevant local groups/experts. Some after dark survey ideas include:

- Tracking bats which is easy with a bat detector and ideal for guided walks - remember to check when the sun sets!
- Light-trapping for moths is well suited to public involvement either on the night or by examining the catch the next morning.
- Live trapping of small mammals by trained people – remember to check traps regularly. Licenses are required.
- Terrestrial invertebrates – many arthropods and molluscs are very active at night. You can search by hand or set pitfall, flight intercept or Malaise traps to check in the morning.

- Beach surveys and rock-pooling – the beach and foreshore come alive with invertebrates at night. Survey by torchlight or set pitfall traps. Check tide times and pay particular attention to safety.
- Audio-recording of birdsong at dusk and as dawn approaches, or include a dawn walk.



White stemmed gum moth (*Chelepteryx colles*) at Panboola BioBlitz, Harrison Warne

TIPS FOR MANAGING AFTER DARK ACTIVITIES

Safety is paramount. Think carefully about the value of remaining on site throughout the night and place safety first. In open public sites think carefully about security and who else might use the site after dark.

Decide who you want to be on site. You will need to track who is where at all times. Ask participants to sign in and out of Basecamp. Decide how many (if any) members of the public you will have on site, at what times and take bookings in advance. Public participants should be supervised at all times.

Will you need to provide sleeping arrangements? Get site permissions before allowing people to camp on site.

Ensure the site is secure and adequately lit. The main access routes to and from Basecamp should be obvious. Ensure there are always at least two people at Basecamp.

Organise plenty of food and hot drinks and ensure you have 24-hour access to toilet facilities.

Write clear emergency procedures and brief everyone who will be on site overnight.

Work in pairs or small groups (never alone) and take particular care around water.

Ask everyone to wear a reflective jacket and carry a whistle and torch.

Be sensitive to people who live nearby and notify the local community and police/coastguard that you will be on site.

Data entry and species identification can continue through the night and it is great to be able to provide up-to-date species totals at the start of day two. However, make sure everyone gets a rest!



Moth hunt at Panboola BioBlitz, Harrison Warne



Frog and bat survey at Bermagui BioBlitz



IF WE INTEND TO LIVE ON THIS PLANET,
WE TRULY NEED TO KNOW HOW IT WORKS."

THOMAS MCGUIRE



Basecamp at Tanja at Mimosa Rocks BioBlitz



Moth preparation, Glen Cocking at Mimosa Rocks BioBlitz

Science at Basecamp

Basecamp will be the hub of activities at your BioBlitz. As well as areas for species identification, results and data entry, you can organise a range of Basecamp activities which will encourage participation and complement the field surveys.

Some Basecamp activities include:

- A mixture of drop-in and guided activities with clear information about what is going on, where and how to join in.
- Recording activities - encourage people to take part in recording activities. Incentives such as goody bags, stickers or badges might be offered for children who complete one or more activities.
- Basecamp Blitz – intense surveying/ photographing of the species found around Basecamp.
- Micro pond dipping – a tank with example specimens form your pond dipping station.
- Microscopes always draw a lot of interest, especially if linked to a laptop, flat screen monitor or projector. A mix of compound and dissecting microscopes (which allow observations of larger specimens) is best. The monitor can help you explain what is



being looked at, and several people can interact at once. Try analysing a sample of soil, sand, contents of a plankton net or pond water.

- Some surveys will require background briefings pre- or post-survey. These can also be interesting to those not involved in the surveys.
- Wildlife-related stands, stalls and presentations, nestbox and insect hotel building, flower pressing, face painting and crafts. Don't underestimate the value of these as icebreaker activities to encourage participation and to cater for younger children and casual drop-ins.
- Museum in a Box - the Australian Museum for instance can loan super boxes of museum specimens and resources that will add a lot to your displays. Contact your local or State Museum to see what loan material is available.
- Competitions, such as wildlife photography/drawing and guess the number of species that will be found, can be really popular.
- Display and membership stands for natural history groups (e.g. friends groups, conservation or volunteering organisations, natural history societies, scuba diving clubs etc) - encourage organisations to create active and interesting displays.
- Running structured activities with the public is very rewarding but can also be tiring so rotate duties among volunteers.

“

EQUIPPED WITH
HIS FIVE SENSES,
MAN EXPLORES
THE UNIVERSE
AROUND HIM
AND CALLS THE
ADVENTURE
SCIENCE.”

EDWIN POWELL HUBBLE



Basecamp volunteers, Harry Bowey Reserve BioBlitz



BioBlitz Event Management

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Night survey at Woomargama BioBlitz, Esther Beaton



EVENT MANAGEMENT IS A COMBINATION OF GOOD PLANNING, PROJECT MANAGEMENT AND PROMOTION. FOR YOUR BIOBLITZ TO RUN SMOOTHLY AND BE ENJOYABLE AND SAFE FOR EVERYONE YOU NEED TO DEVELOP AN EVENT MANAGEMENT PLAN. THIS SECTION OF THE GUIDE COVERS KEY ASPECTS YOU NEED TO CONSIDER – FROM WHERE, WHEN, HOW, WHAT THROUGH TO WHAT NEXT.

Where to run a BioBlitz



The BioBlitz location and its habitats will influence the overall feel of the event and what is found. It also affects how it needs to be managed to run smoothly, so choose carefully considering locations where biological surveys will be valuable (the science) and locations that are accessible and appealing (the event).

- National and public parks, local nature reserves and privately owned landholdings that are publicly accessible are all popular locations. Keep in mind that urban settings are useful settings for a BioBlitz providing a connectivity to nature and landscapes that many people might not be familiar with.
- Remember you will need to gain access permission for your chosen venue and, if you are planning a 24 to 36 hour event, you will probably be onsite overnight. In this case, you may need local overnight accommodation or camping facilities and you will also need to consider site security.
- Your chosen location should:
 - o be safe, particularly after dark
 - o contain the desired habitats and species groups
 - o be easily accessible to your chosen audience, with good transport links and sufficient parking
 - o be able to cope with your expected audience size without any negative impact on biodiversity
 - o contain a suitable Basecamp site preferably with appropriate facilities, including toilets and catering (an added cost if you need to arrange these separately)
 - o have internet and Wi-Fi access if possible (an added cost if you need to arrange these separately)
 - o be mindful of any significant conservation or cultural sites in the survey area that might limit significantly the activities which can be undertaken.



When to have a BioBlitz



Insect survey at ReefBlitz, Gary Cranitch, Queensland Museum



Waterbug survey at Oaklands Wetland BioBlitz, Philip Roetman

The timing and duration of a BioBlitz is very important in order to achieve productive survey results (the science) as well as enabling and encouraging the participation of a diversity of target groups (the event).

- Are there constraints on when your BioBlitz can be scheduled? Avoid competing with other popular local or national events such as public and school holidays.
- You can find wildlife at all times of year but late spring, early summer, and early autumn are good for spotting a wide range of species, with day length and temperatures more favourable for outdoor activities. You are unlikely to find as many species if you hold your BioBlitz off season.
- Many events run Friday to Saturday, with a focus on schools on the Friday and a broader family audience on Friday evening and Saturday.
- A BioBlitz traditionally runs for 24 to-36 hours.
- For an official opening, consider late morning to give most people time to arrive, but your birdwatchers and other specialists will probably want a dawn start. Most BioBlitzes start early.
- Consider bringing people together for a “Welcome to Country” at some stage.
- For coastal events, it is important to coincide with a particularly low tide and schedule activities to fit in with tide times.
- In areas where fire could be a risk, avoid the fire season.

BioBlitz Team



An inclusive partnership or collaboration approach is essential when planning a BioBlitz. You will need a diverse team of individuals and organisations to achieve meaningful outcomes and make the best of available resources and capability.

Organisations – your partners

- Teaming up with other organisations is an excellent way to share and leverage ideas, expertise, event management, resourcing and promotion of the event.
- An effective BioBlitz collaboration will ideally include partners with local knowledge, species expertise and an interest in the species records collected.
- Local Indigenous groups, museums, universities, natural history societies, community groups, councils, National Parks, natural resource managers, gardening clubs, environmental education centres, science hubs and individual naturalists are all good starting points for creating your BioBlitz network. It is vital to engage with local groups and potential partners as early as possible in the planning process. Environmental expertise will be necessary for a successful event not only on the day but also in selecting the most appropriate site, time of year and activities.
- Seek out local companies and their employees who may like to participate in the BioBlitz – this could be in terms of sponsorship, but also as participants serving their volunteering or corporate social responsibility agendas.

- A BioBlitz can raise the profile of participating organisations and it can help to meet their promotional and memberships aims and extend their reach to new audiences.

Co-ordination managing your team

- Essential to your BioBlitz is a coordinator (or coordinators) who will be the “font of all knowledge” but also able to delegate effectively. Support through a central organising committee is helpful to share the load, together with designated roles within that committee – e.g. communications coordinator, safety coordinator, survey coordinator etc.

Scientists and Naturalists – your survey leaders

- As the stars of your show, these experts need to be encouraged to become involved and supported to run the most effective surveys and to enjoy their role. Our experience is that survey leaders really enjoy sharing their knowledge and expertise and nearly all have signed up as regular contributors each time we run a BioBlitz.



KEY SURVEY PLANNING INFORMATION

Once you have agreed the surveys and activities that will be undertaken, you need each survey leader to provide you with detailed information – a Survey Details Form.

It is this information that you need to create your timetables, survey booking information, risk assessments and to ensure all necessary permissions for each activity are granted. See Resources section online for example Survey Details, Risk Assessments and BioBlitz timetables.



Night rock pool survey at Bermagui BioBlitz

- The interaction between survey leaders and the public is a key attraction of a BioBlitz so you will need to support your survey leaders well.
- Work with your survey leaders to decide what sort of surveys to run, what data will be collected and help organise site visits for them. Give them as much information and support as they need to set up and run their surveys effectively. Importantly, you'll need to know what resources each survey leader will need, including equipment, and if they need volunteers to assist them (e.g. recording sightings or taking photographs).
- Some survey leaders may find it useful to have species lists - they may have their own or you can develop them from the species found locally on the Atlas of Living Australia (ALA) database.
- It is useful to meet with the survey leaders on-site before the event to run through the BioBlitz plans and processes, giving them a chance to become familiarised with the location and what will be happening.

Indigenous naturalists – your connection to country

- Indigenous people's involvement in your BioBlitz is extremely desirable. Indigenous knowledge and Indigenous rangers or Elders who are prepared to share some of their deep and particular understanding, add greatly to the learning about many aspects of local biodiversity and ecology.
- Seek to include a local Elder to offer a Welcome to Country. This can set the tone for the event and introduce that close relationship between traditional land owners and the surrounding ecosystems and biodiversity.

Volunteers - your capability resource

Volunteers are the essential workers of a BioBlitz and will determine whether your BioBlitz runs smoothly or not.

Event activities where you will need volunteers are:

Registration: volunteers who will be able to sign participants up to surveys and be at hand to provide information about the BioBlitz.

Catering: help with food preparation and serving throughout the event.

Set up and pack up: help with the set up of the Basecamp and other facilities.



Rare plant survey at ACT Centenary BioBlitz, Stephanie von Gavel



Basecamp reception, Jenny and Gra-ham Greenwood at Mimosa Rocks BioBlitz



Anabat and frog finding at Bermagui BioBlitz



Survey assistants: help with data recording and/or photographing specimens.

Photographers: take photographs of the Basecamp and surveys.

Data entry: enter and monitor data recording forms coming in from surveys. Keep organisers and participants up to date with species counts during the day.

‘Meeters and greeters’: an information service for participants and experts who may not know where everything is and what time surveys and activities start.

First aid: responsible for the health and safety of people at the BioBlitz.

BioBlitz evaluation: responsible for hand out and collection of BioBlitz forms to survey leaders, volunteers and participants.

- You can never have enough volunteers during a BioBlitz, so find out in advance which roles volunteers are most comfortable with. Some will like talking with people, some will like going on surveys and some will like data entry.
- To ensure volunteers don't burn out during your BioBlitz and are able to join-in on surveys and activities, create a roster with 3-4 hour shifts for each volunteer (or shorter or longer depending on how many volunteers there are).

TIPS FOR CREATING A REWARDING EXPERIENCE

If yours is a community led-event that sounds fun and will produce useful data, many scientists and naturalists, organisations and volunteers may offer their time and expertise as a voluntary contribution or as part of their paid work. It helps if your event contributes to their wider goals (for example, by promoting their interest, work objectives or organisation).

In return for their input, you could:

- offer to cover the costs of travel, food and drinks
- enable promotion of their organisation at the event, perhaps with a stall or activity
- provide an event t-shirt – helping to distinguish volunteers and organisers from the public
- incorporate a social activity, such as an exhibition or barbeque following the event
- give free access to all non-sensitive wildlife records
- produce a public report (or website) that shows what has been achieved at the event. It lets volunteers know that their efforts have been appreciated and that they have participated in a worthwhile endeavour.



Discovery Circle at Oaklands Wetland BioBlitz



Bird survey - Steve Sass at Mimosa Rocks BioBlitz

BioBlitz Participants

If targeted well, a BioBlitz can bring together diverse groups of people from the community, contributing to its long term social capital. It can also help to give people a sense of belonging by encouraging them to participate in science and conservation activities in their local area and promote the changes in behaviours and awareness required for effective protection of nature.



Diversity

- As well as already committed local naturalists and scientists, event organisers can attract sometimes hard to reach groups such as young people, the elderly, ethnic, disability and new arrivals groups together with their support organisations. Getting on board the leaders of such groups often leads to attracting people who would not normally get involved in a wildlife activity and provides a richer diversity of BioBlitz social outcomes.
- Target social groups to take part in activities, such as scouts/guides groups, community groups (Rotary, Lions, Probus etc), walking for health groups, scuba clubs, artist groups etc. Perhaps tailor a specific activity to a group such as a cycling safari for your local cycling group, or have some artists produce some artworks interpreting the landscape and the event.
- Knowing the demographic for the region can also help when planning suitable surveys and activities and making it relevant to the general public and those that live nearby.
- University students and trainee teachers have practical components to their studies so consider contacting the relevant student bodies or faculties at nearby universities. Participation by school students is discussed separately below.

Indigenous biodiversity - Graham Moore at Mimosa Rocks BioBlitz





Participant registration

- To maximise participation at your BioBlitz, have a website for participants to register and pre-book for surveys online. Booking systems that are currently free and simple to use are Eventbrite.com and TryBooking.com.
- Early registrations allow organisers to inform and update participants and give an idea of numbers for each survey before the event. Participants will also be able to sign up for remaining survey places in the Basecamp's registration area. See online Resources for an example of a registration form.



Native fish survey at Woomargama BioBlitz

Involving Schools

A BioBlitz is a great way to encourage young people to engage with nature and learn new things in ways that are not part of their usual school activities.

PRACTICALITIES

- If your BioBlitz is in term-time, you may well wish to invite local schools to take part. Previous experience has found that with a Friday to Saturday structure, children will bring their parents back on the second day!
- Make sure the schools are invited well in advance, bearing in mind that it will take schools time to organise, supply teacher cover, book transport, and get permissions from parents. Give them

Case Study

THE PROS AND CONS OF PRE-BOOKING



At the World Parks Congress BioBlitz in Sydney Olympic Park the 'Eventbrite' registration webpage had 1,800 total views. Around 200 people pre-booked for 450 out of a total of 600 spaces, filling nearly all the guided survey spots. So many of the surveys appeared 'sold-out' and this may have kept some interested people away. We were unlucky with the weather with rain for three hours from 7am in the morning and strong winds in the afternoon. Only about 20% of registered participants showed-up. This could have been a disaster but luckily many people joined the BioBlitz on the day

from Planetfest (a public festival event) so the event was successful though not how we expected. In the city we will now expect a drop in the number of people that will turn up, particularly if it's raining. Despite the lower than expected turn-out, participants rated the overall experience highly.

At Mimosa Rocks, our third BioBlitz - in a rural National Park, we used Eventbrite and had 70% of tickets sold before the event. We had very few no-shows so the system helped everyone to plan what they would do and have confidence about the event.



Backyard Explorer - insect survey at Reefblitz, Noel Starick QM

Case Study

BACKYARD EXPLORER - OPENING A NEW WORLD FOR SCHOOL STUDENTS

Experts can open a whole new world to school students. Dr Christine Lambkin (Curator Natural Environments Entomology) and Noel Starick both of Queensland Museum, carried out a Backyard Explorer workshop at Reefblitz 2014. They set up Malaise and pitfall traps in two different habitats at Cannonvale Beach.

Chris and Noel led the workshop with 90 children from Grades 2 and 4 from Cannonvale State School and Whitsunday Christian College, their teachers and parents. The students collected specimens using nets and beating sheets, and learnt characters to identify the major groups of insects at the two sites and counted specimens, allowing comparison of the abundance and richness of invertebrates in the vine thicket (403 specimens in 13 Orders) to the mangrove site (677 specimens in 16 Orders). The data was collated and analysed using the Backyard Explorer Collation Tool, and the results of the survey are available at <http://goo.gl/M8ASZ>.

specific time slots to attend and an idea of what activities they will cover. The teachers may want to visit the site in advance to assess any health and safety risks.

- To create a successful schools session at your BioBlitz it is important to recognise the motivations and requirements of all of the key participants. It is vital to get teachers to 'buy in' to your event as their motivation will be the most significant factor in whether or not their class attends.
- It may be possible to work with a local Environmental Education Centre or museum which can bring particular expertise and experience in natural locations and will know all the curriculum links to the activities they provide.
- Ensure that the naturalists leading activities feel comfortable working with school groups. Discuss content with them well in advance and remember that they may appreciate or need some extra support. Note they may also need Working with Children or Vulnerable people check/cards.

CONTENT

- You will need to match the activities offered with school curricula and learning objectives as it may make your event more appealing to schools, especially if you can also demonstrate a strong science context.





- Demonstrate the scientific method by creating hypotheses for the students to test, or let them come up with their own. Perhaps you could compare the biodiversity of two different habitats on the site?
- As students will be doing fieldwork, try to provide methodologies, examples and perhaps ID lists for the surveys so they have an understanding of what surveys they will be undertaking during the day and the scientific terms that may be used on recording forms. If the schools can go over these with their students prior to the BioBlitz, their limited time at each survey will be maximised and enhanced.
- Providing related classroom activities for teachers to take back to school will increase the educational value of your event.
- Feedback the data collected to the school. They may wish to write up their experiments and/or do some analysis of the data.
- If your survey area includes school grounds, send experts to the school and ask students to undertake surveys of the habitats there.



Waterbug survey at Panboola BioBlitz, Ross Mannell



Beach survey at Bermagui BioBlitz, Martin Ollman

TIPS FOR INVOLVING SCHOOLS

Start early in recruiting school groups as they have limited travel budgets and limited days out of the classroom available.

Think about the practicalities for the school. Will they have a space to have lunch? Is there coach parking? Can they walk to the site? Will there be a lot of administration?

Provide a risk assessment, Parental consent form (including photo consent) and briefing for teachers well in advance, to reduce the administrative burden on them.

Consider what size of groups will be best - perhaps split classes into smaller groups (10 or so) as they will be easier to manage and you will be able to provide a better experience for students.

Involve the teachers and group leaders in BioBlitz activities as well as the students.



Basecamp - the hub of activity

Key to a successful BioBlitz is a busy, well-organised and accessible Basecamp that serves as the focus and heart of the event.



Waterbug survey at Panboola BioBlitz



Basecamp is somewhere for scientists and naturalists to congregate, set off on surveys and report their results, and for participants to register, find out how to take part and see what has been found so far. It can also offer a range of different activities and demonstrations to create a depth of experience.

Basecamp fundamentals

From an event management perspective, Basecamp needs to be:

- Welcoming, safe, secure and easy to navigate around.
- Centrally located within your activity or survey area and preferably have a building (or site for a marquee or tents) as a central gathering point.
- Easy to find and accessible to the public including close to parking and/or public transport links.
- Close to catering and toilets (accessible 24 hours if your event is running over-night).
- Connected to necessary services – electricity (or portable generators) for lighting and facilities as well as phone access (fixed or mobile signal) for internet/wi-fi access.



Records input and ID at
Mimosa Rocks BioBlitz

- Adaptable, by taking into account possible bad weather and security issues.

Basecamp focal points

Basecamp should have spread around it a series of focal points for various event management and science activities.

INFORMATION/REGISTRATION POINT

- A table where people can find out all about the BioBlitz - make sure personnel here are good communicators, are well informed and enthusiastic.
- Participants will register, sign up for activities and collect all necessary information here. Your registration process must keep track of participant numbers, contact details and signed disclaimer and photo permission forms for each survey.
- A location for first aid, lost child/possessions, fire extinguisher points, and a master information folder including all relevant forms and details.
- A box of useful bits – antiseptic hand-gel, sunscreen, tick and insect spray, bin bags, tape, string, cable ties, scissors, etc.

BIOBLITZ MAP AND TIMETABLE

- It is a good idea to get a large map printout of the whole BioBlitz area to display at Basecamp.
- Mark on the map where each of the survey areas are relative to the Basecamp location.
- The map should be placed next to a large timetable, so everyone can see when and where their surveys will take place.

IDENTIFICATION ZONE

- This is the identification and learning area and includes learned personnel and equipment. It should include necessary identification and data recording equipment such as field guides, microscopes, cameras, laptops and internet access if possible. It is useful to have a range of different identification resources, from entry-level laminated guides to advanced identification books with keys.
- In addition to reference books and guides, there are numerous online resources such as the Atlas of Living Australia, Bowerbird, iNaturalist, Museum Field Guides for each state and many others. Searching Google images online can also



be valuable. Some online resources also allow you to upload photos of species to be identified by an online community of naturalists and taxonomists.

- Event organisers, survey leaders and experienced volunteers should be prepared to assist on the day with species identification or guiding people to resources.
- Lots of plastic pots, trays and magnifying glasses for specimens! Once a species has been identified, label it e.g. Christmas Beetle - *Anoplognathus pallidicollis*. People can then look at the specimen alongside the guides. Some organisms will need to be dissected to be identified. Think about whether you want this to happen during or after the event, but be ready to explain the need for it.

RESULTS AREA

- The results area is a central point to collate your species records and display the results.
- You could use low-technology blackboards or, if you are using an online data portal with live data entry, you could use a projector or TV to display

live results (be aware of the need for a darker area if you are projecting images). You will need data entry volunteers to help.

- Bring a small scanner and memory card reader to digitise notebooks and collated specimen photos (or scans for seaweeds and plants) as evidence to support records.

REST AND REFRESHMENT AREA

- Organisers and volunteers will need somewhere to sit and renew energy between surveys, particularly if they are working overnight.
- Decide whether local cafes will be sufficient for the needs of participants and be sure to alert them to your event. You may wish to work with a group like Rotary or CWA to provide food and drinks.

SECURE AREA

- A place for organisers and volunteers to leave personal possessions and store field equipment when not in use.




Basecamp at night, Panboola BioBlitz

Information sharing



With communication comes understanding therefore it is important to share all the necessary information and documentation with workers and volunteers so they know what is happening and their role in the smooth running of the event.

Information packs

- Send out an information pack or a website link to everyone who has signed up to help. You will need packs tailored to each group: survey leaders, volunteers, schools and participants.
- Information packs should include:
 - o Background to the event, including your goals.
 - o Event plans - where (map), when, timetable of events and surveys, parking, local accommodation, food, facilities.
 - o Survey information - collecting policy, recording forms, information about any protected or sensitive areas.
 - o Safety information and procedures - sun protection, sensible clothes & footwear, as required - how best to cope with ticks, snakes, spiders etc. Be aware of issues specific to your area. It is important to provide advice as some people may not be used to being out in nature.
 - o First aid and emergency protocols/contacts/points of assembly.
 - o Links to relevant websites and data capture portals or apps being used.
 - o Measuring strip - for adding scale to specimen photos.
 - o Your contact details.
 - o Acknowledgement of funders and supporting organisations.
- Ensure, when they start each survey, that all survey and activity leaders have agreed descriptions of their surveys including methodologies, times, location, numbers and risk assessments as well as their survey recording forms. 

Important documentation

- Public Liability Insurance and Professional Indemnity is required for all public activities.
- Licences and ethics approvals. Ethics approvals are required in most states and territories for handling all animals and fish. Your survey leaders must have the necessary licences and ethics approvals for the surveys they wish to undertake. They need to provide you with copies when they complete their Survey Details Form.
- Compile an emergency contacts list, including phone numbers for key organisers, first aiders and volunteers.
- Keep copies of important documentation, along with any other useful information such as a timetable, maps and briefing notes, within a master folder at the Basecamp information point.



Promoting the BioBlitz



Sugar Glider (*Petaurus breviceps*) on Hickory Wattle (*Acacia implexa*), David Gallan

Spend some time planning how to promote your BioBlitz as effectively as possible. The aims and scale of the event will influence how widely you want to spread the word and the best ways of achieving this.

In any promotion or publicity around your BioBlitz think about some of the following points, and incorporate them into a Communications Plan which should include the following:

Goals – what are your key messages and main aims for promotion e.g. attendance at the event, creating awareness of BioBlitzes and citizen science generally, building partnerships in the community?

Audience - identify the main audiences for communication. What do you know about each audience and what is the best way of communicating with them?

Communication Tools – what are the tools and channels to support your objectives, audiences and available resources? e.g. social media, e-newsletters and partner networks, information flyers, media interviews, roadside banners etc.

Action Plan and Timeline – consider the timing of each of your communication activities, including post event, and who is responsible for the different actions.

Goals

- A key message is the concept of a BioBlitz itself. The name 'BioBlitz' has developed international recognition in the media as an exciting and fun way to get people exploring natural spaces and discovering wildlife. No-one owns it, and you don't need to use it if you don't want to, but you may gain extra media coverage and networking opportunities if you do!
- Explain the different ways people can get involved. For example:



Do you have expertise on certain species or habitats?

Lead or assist on a survey or help us identify species

Can you take photos of our species and activities?

Join us on a survey and add your photos to our database

Do you have digital or artistic skills?

Help us record information and data or interpret the landscape in an artistic form

Do you want to have fun, explore and learn?

Drop-in and say hi, join as a survey participant, or just spread the word



ABC Radio interviewing John La Salle (ALN) at Bernagui BioBlitz

Case Study

INTERVIEWS WITH SURVEY LEADERS & PERSONALITIES

You will find that all the naturalists and scientists who are involved with your BioBlitz are a great source of publicity. Radio and newspapers are all keen to hear what insights these specialists can give. We have found that giving a list of the surveys we are running and contact details for those Survey Leaders who are happy to give interviews, is a great way to develop interest in the event. Have as many photographers as you can find and any radio and press reporters who are willing to join in at the BioBlitz as this will give you great images and interviews to use in future publicity.



Audience

- Invite groups you think will be interested, and inform all your contacts and networks of the broad event details, location and date - encouraging everyone in your partnership to do the same.
- Inform local and national bodies which might help promote your event (e.g. Local Council, Tourist office, the Atlas of Living Australia, Inspiring Australia, the Australian Citizen Science Association).

Communication tools

- Design and order logos (see online Resources for the Australian BioBlitz logo and how to adapt it), signs, banners T-shirts, posters and programs for public attendees (if required).



Figure 1 Adapt this logo by adding your own location name.

- Design, print and circulate publicity material and press releases, and provide them to relevant groups and organisations.
- Social media including Facebook, Twitter, email newsgroups, online biodiversity-related communities and blogs can be useful publicity tools; remember to include links to more detailed information on your website.
- Advertise locally in the weeks leading up to your BioBlitz using flyers in libraries, shopping centres, banners at the venue, newsletters etc.
- Consider inviting a celebrity as an added 'hook'.
- You may want to encourage people to book for BioBlitz activities. Eventbrite or something similar can be used.
- Working with the media (newspaper, television and radio):
 - Getting information about your event into the media can be a valuable and cost-effective way to gain publicity.

- Decide on your story before contacting anyone. Remember to make your message as 'newsworthy' as possible – journalists receive a lot of requests, so yours needs to stand out.
- A good story will have human interest and be of local relevance (for example, local communities getting involved in a positive activity). Events that are novel, extreme, large-scale or in interesting locations also stand out.
- We have had success with local radio interviews of agreeable survey leaders who can inspire interest through stories about their passion. Over several weeks this can describe the scope of the BioBlitz and really builds interest.

Action Plan and Timeline

PLAN AHEAD

- Remember that people need enough notice to include events in their busy work and social diaries, and that there are deadlines for certain newsletters.
- Note also the time needed to prepare and distribute printed materials.

ON THE DAY

- Leaflets can be handed out before and on the day in and around the location to inform and encourage residents and passers-by to attend your event.
- Create a live buzz around the event using social media with #hashtag for tweets and Facebook comments. Volunteers can help in creating some critical mass as they may have different social networks to you, widening the reach of your publicity.

AFTER THE EVENT

- Communicate species totals, interesting and exciting finds, stories and other key information, including photographs to the media and the public.
- Remember to evaluate the effectiveness of your plan – what communication tools worked best, what sort of people attended, how did they find out about the event? – this will help make things even better next time.

Budget



The budget of a BioBlitz can vary significantly depending on the scale of event you run, what you are seeking to achieve, the partnerships you create to run the event and the level of supporting grants or sponsorship.

Partner organisations and sponsors can provide cash, human resources or equipment. Attracting these resources will make your event possible, increase the scale of your event and/or save your own resources. You might also consider charging people to participate in your event or some aspects of it, however, this approach has not been tested.

Basic resources required

The following sets out some of the key resources you need to run a BioBlitz. An example budget and equipment list is provided in the online Resources section.

Basecamp set up – marquees, tables, chairs, portable toilets, lighting, generators, first aid kits, PA system, volunteer sustenance, water.

IT equipment – computers & tablets, printer, digital cameras, projectors, Wi-Fi dongles.

Scientific and survey equipment – microscopes, torches, nets, specimen containers, sorting trays, identification books, traps, cameras.

Promotion – advertisements, banners, printed material, flyers, T-shirts.

Personnel – key ecologist costs, travel and accommodation for visiting scientists, project manager, Welcome to Country, database & IT support, security, first aid.

Making the most of resources

- Funding will be required to cover publicity, running costs, equipment and essential personnel.
- People may provide their time freely or pro-bono, or if they are charging, ask if they can provide a discount.
- Discuss whether certain items can be provided on loan and acknowledge this contribution (e.g. company branded tents).
- Leverage existing activities - co-branding in an advertisement, coordinating events with other organisations.
- Some items are re-useable, so consider if an initial investment is valuable especially if you intend to have multiple BioBlitzes.
- Cast your sponsorship net wide – you never know who may be interested, and it never hurts to ask!





Health and Safety

The health and safety of organisers, survey leaders, volunteers and the public participating in your BioBlitz should always come first.



As event organisers you have a duty of care. The following section describes some information you need to consider when planning and running your BioBlitz to ensure that you are prepared, aware and ready.

First Aid

First Aid is an essential requirement for any sized event:

- Arrange first aid cover, with the nature of that cover dependent on the level of risk of injury for your event (see Risk Assessment below).
- Have at least one or more trained first aiders on duty at all times.
- Have an appropriate first aid kit at Basecamp and ensure each survey leader has a basic first aid kit with them in the field.
- Contact your local St John's Ambulance or Emergency Services branch for further advice.

Protection of children and vulnerable adults

The protection of children and vulnerable adults is an important social need and responsibility:

- Prepare a written child protection policy, including avoiding, as appropriate, one-to-one situations with a child and adult.
- Ensure key staff and volunteers have their Working with Children or Working with Vulnerable People check/card noting the various state and territory requirements (See online Resources).
- Clearly state at the event and on registration forms that children must be accompanied by a parent/guardian or teacher at all times.
- Ensure a lost child procedure is in place and communicated to participants.

In the event of an emergency

Be prepared and communicate procedures as to what to do in the event of an emergency:

- Write an easy-to-follow accident and incident procedure to ensure that event organisers and volunteers know what to do in an emergency, including how to evacuate the site.
- Prepare an Accident and Incident Report Form so you can log any that occur, how they were responded to and take measures to avoid a repeat.



A visiting tick adds to species count at Mimosa Rocks BioBlitz

- Give all survey leaders emergency phone numbers to call.
- Plan for how people will communicate if there is an emergency – know which devices are appropriate for use at your location with the types of activities you are planning. Devices that can help with tracking and safety include mobile phones, EPERBs, satellite phones, spot finders and walkie-talkies.

Risk assessment

Understand the risks and their mitigation through a risk assessment.

- Prepare a risk assessment for the event as a whole and also for each activity/survey - identify potential hazards for both the location and the activity, assess how they might harm organisers, volunteers or the public, and evaluate the consequence and likelihood of them actually happening. The final step in the process (mitigation) is to define and implement precautionary measures that either entirely remove these hazards or reduce the likelihood of them happening to acceptable levels.
- Ensure that all survey leaders participate in the

risk assessment process to cover the surveys and activities they are leading. This can be done as they develop their Survey Details form.

- Ensure that your event risk assessment takes into account any dangerous creatures that may be found at the location (e.g. blue ringed octopus), seasonal dangers (e.g. bushfires), and location issues (e.g. water safety, cliffs etc).
- Act on and put in place the mitigation or precautionary measures identified in your risk assessments.
- Communicate the risks as appropriate - copy of the risk assessment to your insurer; briefing volunteers, survey leaders, organisers; briefing participants before they start surveying.
- Activities at night require additional safety considerations:
 - o decide what numbers are manageable/safe;
 - o provide (or require participants to bring) torches and high-visibility vests and work in groups;
 - o a sign-on/off sheet must be available to ensure all participants return from the activity safely by a set time;
 - o refer to phone numbers for participants who do not sign back in;
 - o have an emergency plan for anyone thought to be lost.

Safety focal point

It is important to have a point of contact for health and safety issues:

- Assign a named person ("Safety Officer") to be responsible for health and safety at your event.
- Provide t-shirts or badges to staff and volunteers so it is clear who is involved in running it and their responsibilities.
- Ensure relevant BioBlitz volunteers can be contacted by the information desk and advertise this as the point of contact for incidents.
- Have a central meeting point at Basecamp for all surveys and activities, to enable a safety briefing to be carried out before activities start.



After the BioBlitz

Post-event recognition and acknowledgement, together with analysis of your BioBlitz is very important and maximises the value of what you have achieved. Make the most of enthusiasm around your event and the species records generated by your BioBlitz.

It's not over just yet

IMMEDIATE ACTIONS

- Clean up the site before leaving.
- Acknowledge and thank, at the end of each day, those who helped or assisted, both individually and in a group context (peer recognition).
- Gather and provide some immediate feedback from all involved while it is fresh in their minds and the momentum and enthusiasm is still there.

REPORTING

- Circulate a brief report of the findings and any interesting species and stories to scientists, naturalists, volunteers, the landowner and any sponsors. This could be a thank you email, perhaps including some photographs of the event or some specific feedback about the activities, and a total number of species found.
- Write an event report. Post-event analysis is important and optimises the value of what you have achieved.
- Send a snappy summary of findings to local media contacts so that members of the public can see the results to date.
- Share any reports or feedback with other BioBlitz organisers to help create a continuing community of practice.

CELEBRATE WITH FOLLOW-UP ACTIVITIES

There are a number of ways you can continue the conversation and celebrate post-BioBlitz.

- An exhibition of photos, sightings and stories about a month after the BioBlitz is a good way to bring people together, celebrate the successes, the data collected and to thank everyone who was involved. It also gives you the opportunity to further develop and nourish the network created by the BioBlitz and produces more good publicity.

Case Study

FASCINATING FINDS AND STORIES

Your BioBlitz will be a source of fascinating stories. At the Bermagui BioBlitz many of us were puzzled by a 19cm long dead fish found by Jye Turner, one of the school students, during an estuary survey. Its semi-transparent backbone could just be seen but no-one was confident to identify it.

First tentative thoughts were that it could be a very juvenile deep water Oarfish - which can grow to 8m in

length! Afterwards, Andrew Green a local expert scuba diver went sleuthing and sent the following comments: "I sent my pics of your "oarfish" to Mark McGrouther who is head of fish at the Australian Museum in Sydney. He kindly forwarded the pics to his colleague and eel expert Mike in Tokyo. Turns out it is not an oarfish, but an eel - leptocephalus; although not our common local freshwater eel, but a conger (hence the large size of the leptocephalus)". Jye was fascinated by the investigation as well as the BioBlitz itself, "The best day ever at school" he said.





- Arrange follow-up talks or presentations with local schools and communities showcasing your results and illustrating with your photographs. We have found local libraries enjoy showing what took place at each BioBlitz.
- Start planning for next year!

Legacy

- A report which describes your BioBlitz and its outcomes, including interesting highlights and stories will be an important record of the event. This can be shared with all participants, partners and media and can be used as evidence of value when planning your next one.
- Consider how your data, newly developed experience and capabilities with your enhanced networks and partnerships could be built on to continue greater nature and science engagement into the future.

Feedback and Evaluation

Obtaining feedback and evaluating your event allows for continuous improvement for future events and provides a means to see what worked well and where changes need to be made. It also allows you to measure achievement of your original goals, including reporting to funders to justify funding for future events. Your evaluations will also help build a national picture of BioBlitzes as a tool for public engagement and citizen science, so share with organisations such as the Australian Citizen Science Association.

WHO TO COLLECT FEEDBACK FROM

Gather feedback in a timely fashion from everyone involved (survey leaders, volunteers, the public, organisations etc) so you get a well-rounded view. Consider a meeting of your network as a group to share observations, ideas and reflect on lessons learnt.

HOW TO COLLECT INFORMATION

There are different ways of capturing information for your evaluation and as you will be collecting both qualitative and quantitative data, they all require different levels of effort:

Exit survey - participants fill in questionnaires throughout the event or post event by email.

Exit interview - a short snapshot interview (e.g. 90 seconds duration) specifically designed to capture short and immediate feedback from participants.

Staff interviews - interviews with staff involved in both managing (organisers and volunteers) and delivering (naturalists) the activities, providing both formal and informal feedback.

Observation – having a designated evaluator observing what happened during the BioBlitz and taking contemporaneous notes on the size, composition and reactions of the participants.

WHAT SORT OF INFORMATION TO COLLECT

You will want to collect and evaluate information on different aspects of the BioBlitz, with the questions varying depending on who and what outcome you are trying to measure. Example feedback and evaluation forms are provided in the online Resources.

- Audience demographic
 - o Visitor numbers
 - o Age and gender
 - o Where they come from/postcode (reach of your promotion)
 - o How they found out about the BioBlitz
- Response of participants and organising team/volunteers to activities
 - o Whether they enjoyed the BioBlitz – level of enjoyment?
 - o What aspects did they enjoy the most/least?
 - o Would they recommend the event to others?
- Scientific outcomes (broken down by broad taxonomic category such as birds, reptiles, mammals, plants, etc.)
 - o Number of species recorded
 - o Number of records collected
- Individual outcomes
 - o What did they learn at the BioBlitz?
 - o Did they change their attitude to science, the environment etc?
 - o What did they think was the purpose of the BioBlitz?



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Online Resources

Websites for up to date Australian BioBlitz Guide examples and links:

The following websites will give you links and examples of forms and documentation (Online Resources) mentioned throughout this Guide and which have been created and used in Australian BioBlitzes. These will be updated and improved as our experience develops. Please contact us if you have other information that can be contributed.

AUSTRALIAN CITIZEN SCIENCE ASSOCIATION - ACSA

www.citizenscience.org.au

ATLAS OF LIFE IN THE COASTAL WILDERNESS - ALCW

www.alcw.org.au

ATLAS OF LIVING AUSTRALIA - ALA

www.ala.org.au, particularly for data recording enquiries



Contact experienced BioBlitz organisers

Libby Hepburn

Atlas of Life in the Coastal Wilderness
02 6495 0917
libbyhepburn@btinternet.com

Patrick Tegart

Science in Nature Services
0449 162 594
pd.tegart@gmail.com

Sam Niedra

Better State Environments
0447 183 747
betterstateenviro@gmail.com

Philip Roetman

University of South Australia
philip.roetman@unisa.edu.au
www.discoverycircle.org.au

Online Resources

- Budget
- Survey detail form
- Risk Assessments
- Registration forms
- Recording forms
- Timetables
- Communication Plan
- Promotional material
- Evaluation Questions
- Website links
- Additional BioBlitz and citizen science information
- Survey techniques
- Data upload
- E Registration providers
- Smartphone apps
- Working with children information by State
- Case studies and plans





Example BioBlitzes

Here is a list of the BioBlitzes that we are aware of that have used this model

BIOBLITZ NAME	DAYS	ORGANISER	LOCATION
Bermagui March 2012	2	Atlas of Life in the Coastal Wilderness www.alcw.org.au	Bermagui, NSW
Thurgoona May 2012	2	Slopes to Summit (S2S) and Thurgoona Landcare www.greateasternranges.org.au	Thurgoona, NSW
Slopes to Summit (S2S) Sep 2013	3	Slopes to Summit (S2S) www.greateasternranges.org.au	Woomargama, NSW
ACT Centenary Oct 2013	2	Atlas of Living Australia Mongolo Catchment Group, ACT Govt. and Inspiring Australia	Black Mountain Canberra, ACT
Panboola May 2014	2	Atlas of Life in the Coastal Wilderness and Panboola www.alcw.org.au	Pambula, NSW
Harry Bowey Reserve Aug 2014	2	Discovery Circle www.discoverycircle.org.au	Salisbury, SA
Oaklands Wetland Aug 2014	2	Discovery Circle www.discoverycircle.org.au	Oakland Park, SA
ReefBlitz Oct 2014	2	Great Barrier Reef Foundation www.barrierreef.org	Cannonvale Beach, QLD
Mimosa Rocks Nov 2014	2	Atlas of Life in the Coastal Wilderness www.alcw.org.au	Mimosa Rocks National Park, NSW
World Park Congress Nov 2014	1	Office of Environment and Heritage www.environment.nsw.gov.au/research/bioblitz	Sydney Olympic Park, NSW



	TYPE	HABITATS	NO. OF SURVEYS/ SCHOOL SURVEYS	TYPES OF SURVEYS	SPECIES COUNT
	Natural	Coastal forest, beach, rocky shore, saltmarsh	42	Cliff-top plants, rock pool search, light trapping, mammal trapping, shore bird watching, estuary health assessment	855
	Natural	Grassy woodland	34	Birds, reptiles, amphibians and mammals	100
	Natural	Forest, woodland	34	Indigenous plants, small mammal trapping, harp traps (bats), motion activated cameras	110
	Natural/ urban	Dry hill eucalypt forest	19	Frogs, fish, reptiles, flora, invertebrates, bats	318
	Natural	Rehabilitated wetlands, saltmarsh, estuary, mangroves, beach, coastal forest	40	Mammal trapping, bird watching, guided plant and fungi walks, water bug collection, sweep netting, oyster bag search	686
	Urban	Parklands, river	29	Tracks and traces of local animals, frog and bird searches, water bug collection, guided native and invasive plant walks	150
	Urban	Rehabilitated wetland, parklands	33	Frog spotting, mammal tracks, light trapping, nocturnal ant search, bat monitoring (using anabats), fungi search	130
	Natural	Seagrass, mudflats, rocky shore, beach, mangroves, parklands	23	Rocky rambles, beach combing, guided plant walks, insect collection and identification training	191
	Natural	Coastal forests, rocky reefs, rocky shore, beach, freshwater ponds	44	Guided forest walks, bird watching, small mammal trapping, beach combing, SCUBA diving, motion activated cameras, kayak tours	1,008
	Urban	Rehabilitated parklands, mangroves	38	Insect trapping, bird watching, guided mangrove walks, water bug collection	233



Records and survey results

A BioBlitz is a type of citizen science activity - the volunteer collection of biodiversity and environmental information which contributes to expanding knowledge of the natural environment.

As such, a BioBlitz should produce useful data that contributes to knowledge about species and the ecology of locations. For most events this comes in the form of a list of species records and photos for the location that are passed on to local, state and/or national databases such as the Atlas of Living Australia.

Species occurrence data is used by scientists to understand the dynamics and relationships between organisms and the places in which they live. Changes in species distribution and abundance over time, as well as small and subtle differences between different populations of the same species, can tell important stories to ecologists about the incremental impacts of environmental changes and land-use pressures, and this knowledge assists in better management of ecosystem health. The more comprehensive and accurate the occurrence data is, the more useful it is in the scientific analysis.

What is a biological record?

A biological record is a documented record of a particular species, in a particular area, on a particular date. Often recorders will only note the rare or interesting species but a BioBlitz aims to record everything, common or rare, to build up a full picture of the biodiversity of a site on the day.

If you are new to recording biodiversity occurrences, then contact your relevant state government environment agency, museum, herbarium, the ALA, ACSA, ALCW, or other local nature group for guidance. Universities running environment faculties can also be a useful resource. There are also many excellent resources online, such as the UK National Biodiversity Network's Darwin Guide to Recording Wildlife.

Biological records made by expert naturalists may form the bulk of your species list, however giving the public a chance to take part is arguably the most important aspect of a BioBlitz - getting beginners involved and interested in identification and recording is invaluable to cultivating an interest and appreciation of nature and helping to build the local and national biodiversity database.

The most vital components of a species record are:

WHO

- Who found the specimen and who identified the species? Once the record is submitted it may need to be checked (verified) by an expert.

WHAT

- What is the name of the species? Give a common and scientific name if you can, otherwise note down the higher group level e.g. spider, then seek help with your identification.
- Take a good quality photo if you can - from different angles and with a measuring strip if possible, to support your record.



- Remember that the closer to species level identification that you can get, the more useful the data, but don't guess if you're not 100% sure. In Australia invertebrate species identification is very difficult, even for experts, without a specimen collected. Higher level identification eg Family is acceptable for most groups.

WHEN

- The date it was observed. Recording the time of day is also important for some types of records.

WHERE

- The location of the record, ideally as a latitude/longitude in decimal degrees (WGS84). This is a very commonly used coordinate reference system (CRS) and is the default used in Google Maps, mobile phones and many hand-held GPS units.
- Many data recording tools, including some mobile phone apps will also allow you to simply place a marker on a web-map (or use the on-board GPS) and will automatically capture the coordinates from that anyway.
- If you find the same species in a different location, that is a separate record so you can have multiple records for each species on your list. This is more useful than only recording each species once.

Photographs

Photographs are valuable evidence of a species, particularly if you are uncertain of the identity of the species. They are also essential if the record is to be verified by an expert.

- Clear, in-focus images which show the subject as large as possible and in as much detail as possible will assist in identification and verification, so encourage everyone to photograph what they see and to take the best possible photos.
- Maybe include a "best photo" competition as a BioBlitz activity. It is also important to make it

easy for people to download their images at the Basecamp and this is best done before they leave the BioBlitz!

Recording forms

There are a number of example sites from which you can download standard data collection forms and, if necessary you can adapt these to your needs. Some example sites include:

- Atlas of Living Australia
<http://sightings.ala.org.au/>
- Atlas of Life in the Coastal Wilderness
<http://alcw.ala.org.au/bdrs-core/alcw/bdrs/user/tracker.htm?surveyId=311>
- Australian Citizen Science Association
www.citizenscience.org.au

These forms have been designed to collect detailed and useful records using fields which conform with the international occurrence record data standard (Darwin Core). Survey leaders may also want to supplement the basic fields with some additional data and therefore some adaptation of the basic forms may be required, or they may have an existing standardised recording system they would prefer to use. Understanding the data recording needs of survey leaders well before the event is therefore important in assisting them during the event. Note that a scanner can be useful to copy information contained in field notebooks too.

A BioBlitz is an intensive survey of a local area in a short period of time and therefore there is an increased risk of double-counting specimen records which can significantly distort estimates of species abundance. There are some strategies that you can use to minimise this risk and therefore make the data more useful in scientific analysis. These include:

- For multiple surveys covering the same taxonomic groups (e.g. birds, reptiles, etc.), plan each to cover different areas over the course of the BioBlitz.
- Surveys being undertaken as a guided activity with a survey leader, should have a designated "scribe/data recorder" for the group to provide a single set of records for that survey.



- Activities which allow uninitiated visitors to collect their own records should be either:
 - o encouraged in a designated part of the survey ground, and/or
 - o restricted to a public or child friendly checklist of a limited number of the more common species that they may encounter.

Other ideas for unstructured activities could include a photo competition, a treasure hunt encouraging collections of shells, seeds, leaves or similar non-living species evidence to be converted into records later, nature art or drawing events, etc.

Data Recording Tools

In order to be used for science, the data collected in a BioBlitz needs to be incorporated into a larger database which allows scientists to analyse patterns distribution and change over space and time. The Atlas of Living Australia (ALA) is a national aggregation hub for species occurrence data and also provides a suite of tools for collecting, visualising and analysing this data.

Several Australian BioBlitz projects have already successfully used desktop, web-based and mobile tools for recording survey data and contributing it to the ALA, where it has been used for scientific and ecological work. Some of these tools are listed below with links for more information (in no order of preference or priority):

Biological Data Recording System (BDRS)

<http://www.gaiaresources.com.au/products/bdrs/>

ALA FieldData

<http://www.ala.org.au/get-involved/citizen-science/fielddata-software/>

ALA sightings

<http://sightings.ala.org.au/>

BowerBird

<http://www.bowerbird.org.au/>

OzAtlas

<https://itunes.apple.com/au/app/ozatlas/id509021205?mt=8>

<https://play.google.com/store/apps/details?id=au.org.ala.mobile.ozatlas&hl=en>

iNaturalist

<https://www.inaturalist.org/>

For a more comprehensive listing of available tools which are being used to record data and send it to the ALA, see the page on ALA and www.citizenscience.org.au. These are good starting points when you are considering what tools you might use for your project.

There are also a number of commercial service providers in Australia who could assist with software development and configuration. Note that you should decide before the event which tool you will use rather than allow for multiple tools to be used on the day as that would significantly complicate your data management. Different tools have different strengths and weaknesses, so try them and talk to people who use them.

Maps

In addition to knowing what was seen, when it was seen, and who saw it, it is also very important to know where it was seen – as accurately as possible.

There are several ways that you could do this at your BioBlitz event:

- If your event is in an area with good GPS coverage, use live data recording tools which can capture the actual GPS coordinates on the recording device (also see the Data Recording Tools section).
- Some survey types can have fixed observation points or trapping locations which can be plotted and recorded before the event and referred to in the occurrence record by name.
- Some types of surveys (e.g. For highly mobile species such as birds) lend themselves to a grid-based method. For this you would prepare a map to hand out with an X/Y axis grid referencing system. People record the occurrence in a particular referenced grid cell and the coordinate is the geographic centre of that cell with a radius of uncertainty.



Identification at Basecamp at ReefBlitz, Gary Cranitch, Queensland Museum



Night rock pool survey at Bermagui BioBlitz

- For transect-based surveys you can have a pre-defined plotted transect route and transect name with an occurrence record being made at a certain distance along the transect from the start, or within a particular pre-defined cell on the left or right of the transect path.

Easily readable copies of relevant field maps should be provided to each survey team (and to individuals for self guided surveys) when they go out on their survey event. These should be pre-marked with legible transects, grids, points, etc. as appropriate to the type of survey. Survey leaders and scribes should also be familiar with the spatial referencing/mapping method before leaving on the survey event.

Collating species records

- Explain to participants how you intend to use the records they submit, so anyone taking part knows where they will end up and how they will be shared. Members of the public will be interested to see their data being incorporated and learning about how it can be used.
- If it is technically possible to do so, having a real-time or near real-time display of survey results being constantly updated at the Basecamp is an excellent way of building excitement and anticipation. This may be by way of a simple

tally board or by more sophisticated electronic presentation methods.

- Encourage survey leaders, scribes and individuals to hand in recording forms as soon as possible after the survey throughout the day, not all at the end. As far as possible, try to input your species records on the day (include at least one laptop at Basecamp). Alternatively, you can pull together your volunteer capacity to enter all of the data at a separate 'DataHack' event to crowdsource your data entry.
- Some experts will need to take specimens away to ID them so you will not get their lists until several weeks later. Make sure you highlight this when revealing your final species tally and update people via your website/social media after the event. Busy experts may also need reminding to send over these records a couple of weeks after the event.
- When announcing your grand species total (which can be another publicity opportunity) use wording such as 'so far' rather than 'final' as there may be additional records to come from experts and they may be prompted to submit any outstanding records by the publicity!
- If you use the ALA database as well as any local databases, your records will add to the national biodiversity record.



BiQBlitz
AUSTRALIA

Clockwise left to right: Pastor Ossie Cruse at Panboola, Ross Mannell Cotton Harlequin Bug (*Tectocoris di-opthalmus*) guarding her eggs at Reefblitz, Gary Cranitch QM, Chris Allen and koala scat surveyors at Mimosa Rocks BioBlitz