Threatened Species Recovery Hub

National Environmental Science Programme

Power to detect species recoveries after the 2019-20 megafires under a range of budget scenarios

Final Report

Darren Southwell, Adam Smart, Brendan Wintle

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THE UNIVERSITY OF MELBOURNE

New plant growth after the Black Saturday fires in Victoria in 2009. Image: Greenfleet Australia, CC BY-NC-ND 2.0

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Executive summary

Large-scale disturbances, such as megafire, flooding, cyclones and drought, play a critical role driving the distribution of biodiversity around the world. Monitoring is crucial for understanding how species and populations are immediately impacted and then respond to such events. However, monitoring should be designed with sufficient statistical power to detect impact and recovery. In this report, we developed a framework for optimising the design of biodiversity monitoring programs to detect recovery of species following large catastrophic disturbances. We focused on 119 vertebrates thought to be most affected by 2019-20 megafires in Australia. We combined species distribution models with remotely sensed fire severity maps to optimise the location of paired 'burnt-unburnt' sites in and around the fire footprint. We simulated a range of plausible recoveries in occupancy over the next 10 years, and combined with estimates of detectability, simulated monitoring at sites to evaluate statistical power of alternative monitoring designs. We tested the performance of 6 budget scenarios ranging from $1 – 100M AUS over 10 years. Across all species and taxonomic groups, power increased as the expected magnitude of recovery in occupancy increased. A total monitoring budget of $1M over 10 years resulted in very low power even under the most optimistic rates of recovery. However, power increased as the total monitoring budget increased. A $10M budget could detect 50% recoveries in 24% of species with >80% power. This increased to 47%, 71%, 76% and 79% as total budgets increased to $25M, $50M, $75M and $100M, respectively. Our results could inform the design of government-funded monitoring programs designed to detect responses of vertebrates to the 2019-20 megafires. However, our approach is transferable to detect recovery of species following any catastrophic disturbance.

Introduction

Large-scale disturbances, such as megafire, flooding, cyclones and drought, play a critical role driving the distribution of biodiversity around the world (Whelan, 1995; Bowman et al., 2009). While large-scale disturbances no doubt results in the direct mortality of individuals (van Eeden et al., 2020), the immediate impact on species (i.e. resistance) and how species respond over time (i.e. resilience) is poorly understood for most taxa (Whelan, 1995). This lack of knowledge is partly because large, stochastic disturbances are, by their nature, infrequent and unpredictable (Driscoll et al., 2010), which limits our ability to plan post-disturbance surveys and monitoring (Wintle et al., 2020). Our need to better understand the impact and response of species to large-scale disturbances is becoming more important given the frequency, severity and extent of extreme climatic events is forecast to increase around the world in response to climate change (Boer et al., 2016; Goss et al., 2020).

Monitoring is crucial for quantifying the impact of catastrophic events, for measuring the recovery of populations over time under different management regimes, and for measuring management effectiveness (Field et al., 2007; Possingham et al., 2012). However, designing large-scale, multi-species monitoring programs is complex: decisions must be made about where, when and what to monitor, what to record (e.g. abundance vs occupancy), the types(s) of sampling methods (e.g. camera trapping, audio monitoring, live trapping), the duration of monitoring, the arrangement of monitoring sites within the landscape, and the frequency and intensity of sampling (Einoder et al., 2018). These decisions must be made ahead of time and are further complicated by limited budgets, logistical constraints and the need to complement and not duplicate existing monitoring efforts already underway for many species (Legg & Nagy, 2006).

The 2019-20 megafires in southern and eastern Australia severely impacted populations of threatened species and ecological communities. An estimated 3 billion vertebrates were directly affected by the fires, with many more likely to perish after the fire event due to a reduction in the availability of shelter, habitat and resources (Ward et al., 2020). There is widespread concern that the unprecedented size and severity of the fires may have pushed many species to the brink of extinction. It is therefore crucial that management interventions are directed towards species and communities most affected by the fires, and that rigorous, cost-effective monitoring programs are conducted to track the recovery (or lack thereof) of populations and communities over the short-to-medium term (Wintle et al., 2020). High levels of uncertainty about how and whether species will recover from the 2019-20 megafires further highlights the need for effective and efficient landscape monitoring programs.

A strategic approach is therefore needed to design rigorous, cost-effective monitoring programs to track post-fire recovery of species, management effectiveness and the presence of threats. Monitoring should be representative of the suite of species most affected by disturbances and be designed as efficiently as possible to maximise what can be inferred from limited conservation resources. Further, monitoring should be designed to ensure that there is a high level of statistical power to detect population recoveries should a recovery occur (Field et al., 2005). Statistical power is the chance of correctly rejecting the null hypothesis that no change has occurred. Insufficient investment in biodiversity monitoring can result in Type II errors where the null hypothesis that no change has occurred is falsely accepted due to insufficient data. Such conclusions can result in incorrect conclusions about how species have been impacted and respond to disturbances. Failing to detect population recoveries also prevents advancements in our understanding of how to best manage species following catastrophic disturbance events.

In this report, we used spatial optimisation and simulation tools to explore where and how much monitoring effort is needed after a major disturbance to have a high chance at detecting recoveries in occupancy of priority species over time. We focus on 119 vertebrates considered by experts to be most affected by the 2019-20 megafires in Australia. Our approach explicitly recognises and complements monitoring efforts already underway to assess the impact of the megafires and identifies the relative benefit in terms of statistical power of alternative monitoring designs at detecting impact and recovery. A key aspect of this report is to use power analysis and spatial optimisation in a large-scale, multi-species, monitoring context to propose and evaluate candidate monitoring design options. Our simulation-based approach allows us to understand trade-offs between the number of sites visited, the number of species represented, and the frequency and duration of monitoring given fixed budgets and pre-specified aspirations for confidence in the ability of the program to detect declines or recoveries of a given magnitude.

We addressed the following questions: 1) where should monitoring sites be positioned within burnt and unburnt areas to maximise the chance at detecting recoveries in occupancy levels of priority vertebrates to pre-fire levels?; 2) what is the most effective allocation of monitoring resources across a range of fixed budgets to maximise the chance of detecting recovery of occupancy to pre-fire levels?; 3) which combination(s) of monitoring design decisions increase the ability to detect recovery of populations to pre-fire levels? In answering these questions, we explored the anticipated performance of monitoring designs in terms of the statistical power to detect recoveries in occupancy to pre-fire levels. This will ultimately provide robust, quantitative evidence of the cost-effectiveness of alternative post-fire recovery monitoring designs. While we focused on the 2019-20 megafires in Australia, our approach could be easily applied to inform the design of any biodiversity monitoring programs following large-scale disturbances.

Rockwarbler, Morton National Park, NSW. Image: David Cook, Flickr, CC BY-NC 2.0

Methodology

Study area and species

The study region is composed of 43 temperate, subtropical and Mediterranean bioregions across 2.2 million km^2 of southern Australia (Figure 1). We did not include semi-arid, arid and tropical savannahs because fire is a much more frequent in these regions. We focused our analysis on 119 vertebrates considered most vulnerable to the 2019-20 megafires, consisting of 24 reptiles, 37 frogs, 16 birds, 32 mammals, and 10 bats (Appendix 1). These species were prioritised by experts based on their ecological traits, pre-fire imperilment, and proportion of their geographic range burnt (Legge et al., 2020). The taxonomic units on this list included subspecies and populations, as well as newly described species yet to be accepted in national taxonomic reference libraries.

Figure 1: *Extent of the 2019-20 megafires in Australia. Red shading indicates fire severity.*

Spatially explicit power analysis simulation (SPOTR)

We used a simulation tool, SpotR, to assess statistical power of alternative monitoring designs to detect recoveries in occupancy for priority species (Southwell et al., 2019). To initiate simulations, SpotR requires occupancy or habitat suitability layers for each target species, a list of up to four preferred sampling methods for each species, and estimates of detectability for each sampling method. Users specify the number and location of monitoring sites, the frequency of surveys, the length of the monitoring program and the time spent sampling on each monitoring occasion.

The tool models a trend in occupancy over time (increasing or decreasing) and simulates monitoring data given the choice of sampling methods and monitoring design decisions (i.e. where and how to survey). Monitoring data is simulated and analysed to determine if the predicted trend in occupancy can be detected by the monitoring strategy. The process of data simulation and analysis is repeated hundreds of times – statistical power is calculated as the proportion of times the modelled trend could be detected from the simulated monitoring data. Financial costs can be associated with sampling methods and the location of sites to explore relationships between cost, the number of sites and statistical power. A more detailed description of the simulation framework and how it works is provided in Southwell et al. (2019).

We applied SpotR to the problem of designing a landscape-scale monitoring program to detect population recoveries following the 2019-20 megafires. Specifically, to implement SpotR we conducted the following steps: 1) obtained habitat distribution models for priority species; 2) conducted a spatial prioritisation analysis to identify the most important regions for post-fire monitoring, given pre-fire habitat suitability for target species and fire severity; 3) identified the preferred sampling methods for species and the likely probability of detection; 4) estimated the cost of monitoring given the preferred sampling methods and location of sites, and; 5) simulated monitoring to estimate statistical power across a range of monitoring designs and fixed budgets. These five steps are outlined below in more detail.

Step 1: Species distribution models and fire severity maps

We obtained species distribution models (SDMs) for the 119 priority species from in a recent study by Southwell et al. (2020). The SDMs were developed with post-1990 presence-only data using *MaxEnt* models in R (Phillips et al., 2017) and a set of 16 spatial covariates mapped at 250 m resolution across Australia. We resampled SDM raster layers to 1 km resolution to reduce the number of cells in our study region and ensured all layers were projected to a common equal area coordinate system (Australian Albers; EPGS: 3577).

We obtained a fire severity layer of the 2019-20 megafires from the Australian Government's National Indicative Aggregated Fire Extent Dataset at 40 m resolution (DAWE, 2020). We resampled this layer to 1 km resolution with a majority filter to align with our SDMs. We created a 5 km buffer around the fire footprint and collapsed the five fire severity classes into two: unburnt (class 1 and the unburnt buffer) and burnt (classes 2 - 5). We clipped each predicted species distribution by the two fire classes so that each species was represented by two layers predicting their pre-fire distribution in unburnt and burnt habitat.

Step 2: Prioritising monitoring sites

We used the spatial prioritisation tool Zonation to prioritise areas for post-fire monitoring in and around the fire footprint (Lehtomaki & Moilanen, 2013). Zonation works by using a reverse stepwise heuristic to iteratively remove cells from a landscape based on their biodiversity value (in this case pre-fire habitat suitability) to minimise marginal loss while maintaining connectivity (Cabeza et al., 2004). It generates a hierarchical ranking of cells from 0 (bottom ranked) to 100 (top ranked); the top ranked areas maximise representation of the biodiversity components. We ran Zonation with the 'core area' function and using the species-fire class layers as 'biodiversity features'. This ensured that cells with the highest pre-fire suitability across the set of priority species were identified in both burnt and unburnt habitat.

Step 3: Sampling methods and detectability

We consulted experts and searched the published and grey literature to specify up to four sampling methods for each of the 119 priority species. In total, we listed 24 alternative sampling methods across the four taxonomic groups. We searched the literature for estimates of detection probabilities for one unit of effort for each sampling method (Appendix 1). In instances where we could not find published detection estimates for a given species and method, detection probabilities were back calculated from best practice guidelines or borrowed from analogous species-method combinations. For example, we assumed a similar level of effort between motion triggered cameras for small mammals. For comprehensive tables of methods and detection estimates and repeat visits see Appendix 1.

Step 4: Simulating impact and recovery

We assumed that the 2019-20 megafires reduced occupancy of cells to 0.01 at the start of simulations (t=0) for all species and fire severity classes. Occupancy then increased linearly over 10 years to a proportion of pre-fire levels, hereafter referred to as the effect size. Because we do not know whether or at what rate species will recover, we modelled a range of effect sizes, ranging from 10 - 90% of pre-fire levels. In the absence of any counterfactual data, we assumed suitability of unburnt habitat remained constant over 10 years.

Step 5: Monitoring design

We simulated monitoring to explore the impact of design decisions on power to detect recoveries in occupancy. In all cases, we assumed a 'control-impact' design where sites were paired in burnt and unburnt habitat. During each simulation, we randomly selected 'burnt' sites from the top 10% of the landscape ranked by Zonation before selecting an 'unburnt' pair within a 15 km radius. We set this radius constant, but it could be varied by species or by taxonomic group. We allowed for up to four sampling methods at a site per species. For each sampling method, we set the number of repeat visits (i.e. survey effort) to comply with best practice guidelines and/or to ensure that cumulative detection probabilities were >90%. A summary of the number of repeat visits per sampling method is provided in Appendix 2. In all scenarios, we assumed that monitoring occurs every year for 10 years.

Step 6: Monitoring cost and alternative budgets

We explored six monitoring budgets over a 10-year monitoring horizon; AUD $1M, $10M, $25M, $50M, $75M and $100M. We assumed that the total budget was divided equally across taxonomic groups and survey years and consisted of four components: 1) equipment start-up costs; 2) the cost of conducting a site survey for all species present at a site; 3) travel time to and from a site; and, 4) the number of repeat visits required at a given site within a survey year. During each simulation, the maximum number of monitoring sites x that could be monitored over the management time horizon for a given budget was calculated by:

$$x = \sum_{i,j} \frac{(B - s)/f}{k_{ij}\left(2v_j + c_{ij} + l_{ij}\right)}$$

where *B* is the total budget over the monitoring time horizon, *s* is the once-off equipment set up costs across the entire monitoring project, *f* is the number of survey years, k_{ij} is the number of repeat visits for method *i*, at site *j*, v_j is the cost of travelling to a site, c_i is the per survey consumable cost for method *i* at site *j*, and l_{ij} is the total labour cost of conducting a single site survey for a given survey method *i* at site *j*.

The cost of conducting a site survey was inclusive of the consumable equipment costs (e.g. baits, water filters) and the personnel costs associated with deploying, conducting, retrieving and/or analysing the resultant samples, across all unique methods required for a site survey. Species could be detected by up to four unique methods across the landscape. If multiple species could be detected with a single method the cost of deploying the method is only incurred once per repeat visit for those species. The cost to travel to and from a site was based on an hourly vehicle rate (i.e. personnel cost, insurance, fuel) multiplied by the number of hours required to reach a given field site from the nearest population centre of 5,000 people or more. An accommodation rate of $100 was included for each survey day, and costs were indexed throughout the simulation at a rate of 1.6% per year. At the commencement of the monitoring period, the model included the option to incorporate start-up costs for the subsequent surveys. These costs are based on one-off equipment purchases (e.g. the cost of a motion activated camera trap unit and star picket). As surveys are likely to be conducted by fully equipped organisations, we set the start-up costs to $0 across all scenarios. A full list of costs and assumptions can be found in Appendix 3.

Step 7: Statistical power

For each budget and effect size, we repeated simulations 50 times separately for each taxonomic group. For each simulation, we calculated the 95% confidence interval around an interaction term between a trend in occupancy and whether sites were burnt/unburnt. Statistical power was calculated as the proportion of times the upper and lower confidence intervals were both greater than or less than zero. Across all monitoring scenarios we set the alpha level to 0.1 and conducted a two-tailed significance test.

Results

Across all species and taxonomic groups, power increased as the expected magnitude of recovery in occupancy increased (i.e. the effect size) (Figure 1). For example, there was an 66% chance to detect a 50% recovery in the Blue mountains Tree Frog (*Litoria citropa*) when the total budget across all species was AUS $10M. However, power increased to 80% and 88% under this budget scenario when we assumed a 70% and 90% recovery, respectively, over 10 years (Appendix 4).

Our results suggest that a total monitoring budget of $1M distributed across all species over 10 years resulted in very low power to detect population recoveries, even under the most optimistic rates of recovery (i.e. 90%) (Figure 2). In fact, no recoveries could be detected in any species with >80% power with this budget. Not surprisingly, power increased as the total monitoring budget increased. A $10M budget could detect 50% recoveries in 24% of species with >80% power. This increased to 47%, 71%, 76% and 79% as total budgets increased to $25M, $50M, $75M and $100M, respectively.

Across all budgets and recovery rates, power was lowest for birds and reptiles and generally highest for mammals and bats. For example, under a $25M budget and a 90% recovery rate scenario, power to detect population recoveries exceeded 80% for all bats, 97% of mammals, 68% of frogs, 44% of birds and 29% of reptiles (Appendix 4).

Power remained very low for a subset of species regardless of the budget or recovery rate. These species were generally either: 1) highly range restricted; 2) widespread but had very low pre-fire occupancy levels; 3) difficult to detect and/or had few effective sampling methods, or; 4) expensive to survey, which reduced the number of sites. For example, power to detect population recoveries of the Rufous scrub-bird (*Atrichornis rufescens*) did not exceed 0.23 across any budget scenarios. Similarly, power to detect recoveries in the Three-toed snaked-toothed skink (*Coeranoscincus reticulatus*) was never greater than 0.26.

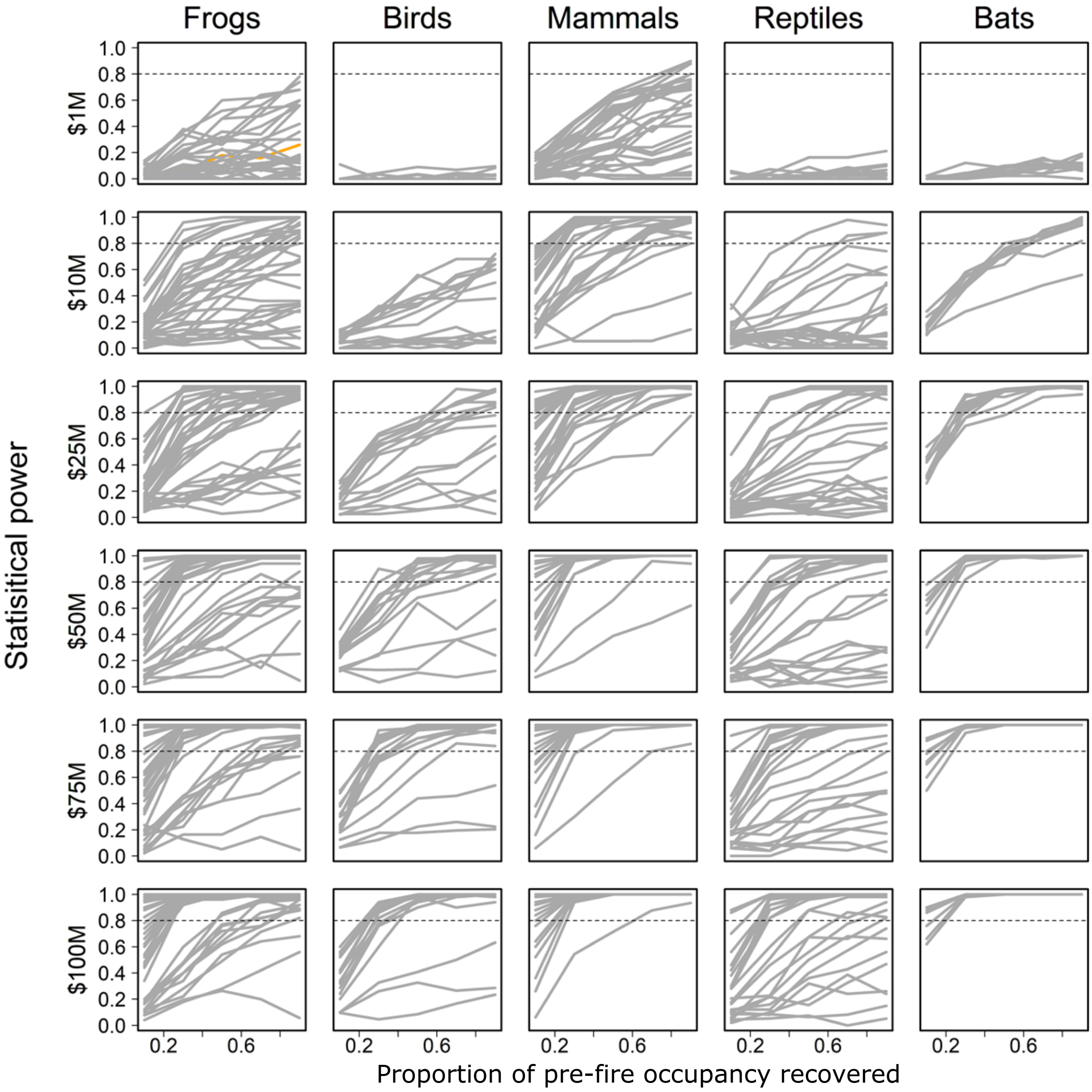

Figure 1. *Statistical power (y-axis) to detect population recoveries to a proportion of pre-fire occupancy levels (x-axis) for 5 groups of species (columns) and total monitoring budget scenarios (rows). The horizontal dashed lines represent 80% power.*

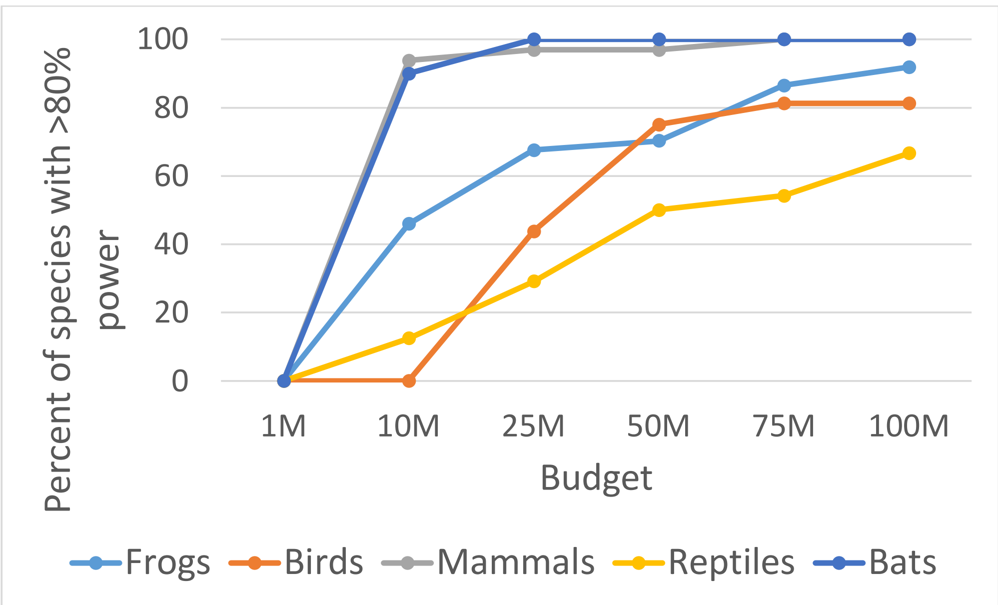

Figure 2: *Percent of species in each group (y-axis) with >80% power to detect 90% recoveries to pre-fire occupancy levels over 10 years across a range of fixed budgets (x-axis).*

Discussion

Designing multi-species landscape-scale monitoring programs requires a series of complex decisions. When monitoring whether and how species recover from large-scale disturbances, there are trade-offs in decisions regarding the method(s) deployed, the number of repeat surveys for a given method, the years in which sites are to be monitored, and the total number and location of long-term monitoring sites established to detect changes in a species occupancy levels. These questions are further complicated by limited resources available for long-term monitoring. In this study, we demonstrated the utility of a simulation framework for evaluating alternative monitoring scenarios ahead of time for a realistically complex continental-wide monitoring program to estimate the total cost required to detect likely population recoveries in the next 10 years. We showed that changes in the total available budget and the recovery rate of populations influences statistical power.

Drivers of power and budget

Unsurprisingly, power increased across all taxonomic groups as the total available budget increased. This was because an increase the budget meant more sites were available for monitoring across the landscape, which is a key driver of statistical power. The total monitoring cost available for each species varied across budget scenarios; for example, a total budget of AUD $1M equated to on average $8403 per species, whereas approximately $840,336 was spent per species with a AUD $100M budget. Importantly, we demonstrate how the response of power to changes in budget was species-dependant and nonlinear, demonstrating that the relative gain in power per unit increase in funding is not constant. Thus, no increase in monitoring budget will benefit all species to the same degree. We also demonstrated that return on investment in terms of power diminishes under higher budgets scenarios for some species and taxonomic groups as power approaches 1. Further investment in monitoring of such species will not benefit power. For example, all bats and 97% of mammals could be detected with high power assuming a $25M budget and 90% recovery rates. Further investment in monitoring therefore provided little additional benefit to these taxonomic groups.

Power was low for a subset of species regardless of the recovery rate and budget. This could be because either: 1) species ranges were highly restricted within the burnt zone, which meant that the simulated monitoring sites were rarely placed in cells of high habitat suitability: 2) species were widespread but had very low levels of occupancy, which meant that sites were rarely occupied and available for detection; 3) sites were occupied but difficult to detect even with multiple sampling methods due to low probabilities of detection or too few repeat visits; and 4) there were few sites for a taxonomic group because sampling that group was expensive. Visual inspection of the SDMs for species with low power suggests the first point was the most likely explanation, especially because we specified a monitoring design with sufficient repeat visits to ensure high levels of detectability. Our framework assumes occupancy is the state variable of interest and does not yet accommodate changes in abundance or density. Species that had consistently low power across all budget scenarios – especially those with very narrow distributions – are probably better suited to monitoring programs that focus on abundance and/or density. Power to detect changes in abundance will be much higher with fewer sites, but can be more difficult and expensive to measure. We recommend our framework be expanded to accommodate both occupancy and abundance data and that sampling methods that generate this type of data be considered for these species.

Limitations

We utilised existing SDMs developed by Southwell et al (2020). These were developed using Maxent models fitted to presence-only occurrence records with pseudo background data to account for survey bias. This meant that the SDMs used in our simulations represent relative habitat suitability scaled from 0 to 1, rather than a probability of occupancy. This was a major limitation because our framework requires occupancy probabilities to simulate the occupancy status of cells during simulations. We therefore assumed that the SDM values (relative habitat suitability scores) corresponded to occupancy probabilities, although we acknowledge that this will not be the case. This means the absolute estimates of power presented here should be treated with caution; however, the relatively gains in power under each scenario will still hold. One way to test the sensitivity of power to this assumption is to convert the current SDM values from a relative likelihood to a probability scale using estimates of the prevalence rate across the landscape. We could then run our power analysis using a calibrated SDMs on a probability scale compare to the current SDMs which represent relative likelihood. However, this would require significant additional work, first sourcing independent prevalence data for species, then doing the calibration.

Future research

We made simplifying assumptions about the impact of the 2019-20 fires on habitat suitability and post-fire recovery. Firstly, we assumed that habitat suitability within the fire footprint was reduced to 0.01 for all species regardless of taxonomic group or fire severity. Secondly, we assumed habitat suitability increased linearly after the fire over 10 years. We had no prior knowledge of the rate of recovery, so we tested alternative scenarios, ranging from 10 – 90% of pre-fire levels. The immediate impact and then recovery of large-scale high intensity fire on biodiversity is poorly understood. However, a recent study elicited the likely impact and recovery rates for all species considered here. Our analysis could be extended to include species-specific changes in occupancy and recovery rates immediately after, and following, the fires across different severity classes. This would provide power estimates for more realistic impact and recovery scenarios for each species. For example, power would likely be lower for species not reduced to such low levels immediately after the fires. Any further analysis could also incorporate non-linear responses over time, should any information support such a response. We expect that the shape of recovery will likely be species specific and depend on the location of a site in the landscape, the health of the population pre-fire and the availability of key resources post fire.

The framework presented here has the ability to take in spatial maps of management actions across the landscape and simulate the power to detect additional benefits in recovery in due to these actions. A current limitation is we do not have data surrounding which areas of the landscape are presently or likely to be managed over the next ten years, although work is currently underway to understand the most cost-effective actions and areas to implement management across Victoria. In addition, there is currently a lack of data surrounding individual species responses to management actions after widescale fire (although once again, research is currently underway to elicit likely responses from experts). Our framework could be conducted in an iterative cycle every few years when monitoring and management data are available to refine expectations about the cost needed to adequately detect population recoveries. Any updated analysis could also include spatial layers of management interventions, and if possible, estimates of the effectiveness of those actions, plus how they benefit recovery.

A powerful feature of this framework is that any unique combination of up to four sampling methods can be defined for each species. This is particularly useful for evaluating or designing large-scale monitoring programs where more than one sampling method might be deployed at sites to detect species. The benefit of incorporating multiple sampling methods is that the relative contribution of each to power can be explored. For example, many mammals within the bushfire zone can be detected with both active trapping and passive motion triggered camera traps. A useful extension to this work is to accommodate unstructured survey data collected by citizen scientists and volunteers. There has been substantial efforts by citizen scientists to document species' occurrences following the 2019-20 bushfires and upload records to databases, but there is currently no framework to combine these data with structured surveys to assess population trends or recoveries. Simulating citizen science data across the landscape and quantifying how this data contributes towards assessing population recoveries is a crucial area of future research. Another important extension of this work is to repeat the analysis for plants and invertebrates, as these are often neglected from biodiversity monitoring programs.

Conclusion

Monitoring is needed to learn about the impact and recovery of biodiversity following large-scale disturbances such as megafires. We demonstrated the utility of a simulation framework for evaluating alternative monitoring scenarios ahead of time for a realistically complex continental-wide monitoring program in response to the 2019-20 megafires. Our approach allowed us to estimate the total cost required to detect likely population recoveries in the next 10 years. We showed that changes in the total available budget and the recovery rate of populations influences statistical power. Well designed and cost-effective monitoring programs will become increasingly important as the frequency and intensity of large-scale disturbances increase due to climate change.

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Bush fire, Australia. Image: Stephen Mitchell, Flickr, CC BY-NC-ND 2.0

Appendix 1: Species list and sampling methods

		Method 1		Method 2		Method 3	
Group	Species	Survey Type	Detection Estimate	Survey Type	Detection Estimate	Survey Type	Detection Estimate
Birds	*Anthochaera phrygia*	active	0.37	area	0.21		
Birds	*Atrichornis rufescens*	area	0.44				
Birds	*Callocephalon fimbriatum*	area	0.44				
Birds	*Calyptorhynchus lathami halmaturinus*	area	0.44				
Birds	*Calyptorhynchus lathami lathami*	area	0.44				
Birds	*Climacteris erythrops*	area	0.44	mist	0.44		
Birds	*Dasyornis brachypterus*	area	0.44				
Birds	*Menura alberti*	area	0.44				
Birds	*Menura novaehollandiae*	area	0.44				
Birds	*Monarcha melanopsis*	area	0.35				
Birds	*Origma solitaria*	area	0.44				
Birds	*Pezoporus wallicus wallicus*	acoustic	0.66	point	0.63	autoacoustic	0.44
Birds	*Psophodes leucogaster lashmari*	area	0.32	acoustic	0.66		
Birds	*Pycnoptilus floccosus*	area	0.44				
Birds	*Stipiturus malachurus halmaturinus*	area	0.9				
Birds	*Zoothera lunulata halmaturina*	area	0.44				
Reptiles	*Amalosia lesueurii*	area	0.68	spotlight	0.68		
Reptiles	*Austrelaps labialis*	area	0.68				
Reptiles	*Austrelaps ramsayi*	area	0.68				
Reptiles	*Calyptotis ruficauda*	area	0.68	pitfall	0.44		
Reptiles	*Carinascincus coventryi*	area	0.68	pitfall	0.44		
Reptiles	*Coeranoscincus reticulatus*	area	0.68	pitfall	0.44		
Reptiles	*Cyclodomorphus michaeli*	area	0.68	pitfall	0.44		
Reptiles	*Cyclodomorphus praealtus*	area	0.68	pitfall	0.44		
Reptiles	*Drysdalia rhodogaster*	area	0.68				
Reptiles	*Egernia mcpheei*	area	0.68	pitfall	0.44		
Reptiles	*Eulamprus heatwolei*	area	0.68	pitfall	0.44		
Reptiles	*Eulamprus leuraensis*	area	0.68	pitfall	0.44		
Reptiles	*Eulamprus tympanum*	area	0.68	pitfall	0.44		
Reptiles	*Harrisoniascincus zia*	area	0.68	pitfall	0.44		

		Method 1		Method 2		Method 3	
Group	Species	Survey Type	Detection Estimate	Survey Type	Detection Estimate	Survey Type	Detection Estimate
Reptiles	*Hoplocephalus bungaroides*	area	0.25				
Reptiles	*Liopholis guthega*	area	0.68				
Reptiles	*Lissolepis coventryi*	area	0.68	pitfall	0.44		
Reptiles	*Myuchelys purvisi*	active	0.68	fyke	0.12		
Reptiles	*Phyllurus platurus*	area	0.68	spotlight	0.68		
Reptiles	*Pseudemoia cryodroma*	area	0.68	pitfall	0.44		
Reptiles	*Pseudemoia rawlinsoni*	area	0.68	pitfall	0.44		
Reptiles	*Saproscincus mustelinus*	area	0.68	pitfall	0.44		
Reptiles	*Saproscincus rosei*	area	0.68	pitfall	0.44		
Reptiles	*Saproscincus spectabilis*	area	0.68	pitfall	0.44		
Mammals	*Acrobates pygmaeus*	camera	0.54	spotlight	0.68	thermal	0.62
Mammals	*Aepyprymnus rufescens*	camera	0.71	hair	0.44	area	0.68
Mammals	*Antechinus agilis*	camera	0.71	hair	0.44	area	0.68
Mammals	*Antechinus mimetes*	camera	0.71	hair	0.44	area	0.68
Mammals	*Antechinus stuartii*	camera	0.71	hair	0.44	area	0.68
Mammals	*Burramys parvus*	camera	0.54	elliot	0.44	hair	0.44
Mammals	*Cercartetus nanus*	camera	0.54	elliot	0.44	spotlight	0.68
Mammals	*Dasyurus maculatus maculatus*	camera	0.42	cage	0.44		
Mammals	*Isoodon obesulus obesulus*	camera	0.54	cage	0.44	hair	0.44
Mammals	*Mastacomys fuscus mordicus*	camera	0.54	cage	0.44		
Mammals	*Notamacropus parma*	camera	0.63	area	0.68	thermal	0.62
Mammals	*Notamacropus rufogriseus*	camera	0.63	area	0.68	thermal	0.62
Mammals	*Ornithorhynchus anatinus*	fyke	0.12	edna	0.62		
Mammals	*Perameles nasuta*	camera	0.54	cage	0.44	hair	0.44
Mammals	*Petauroides volans*	spotlight	0.68	thermal	0.62		
Mammals	*Petaurus australis*	camera	0.54	spotlight	0.39	thermal	0.62
Mammals	*Petrogale penicillata*	camera	0.63	area	0.68	thermal	0.62
Mammals	*Phascolarctos cinereus*	area	0.68	autoacoustic	0.45		
Mammals	*Potorous longipes*	camera	0.71	hair	0.44	area	0.68
Mammals	*Pseudomys fumeus*	camera	0.63	elliott	0.45	area	0.44
Mammals	*Pseudomys novaehollandiae*	camera	0.63	elliott	0.45	area	0.44

		Method 1		Method 2		Method 3	
Group	Species	Survey Type	Detection Estimate	Survey Type	Detection Estimate	Survey Type	Detection Estimate
Mammals	*Pseudomys oralis*	camera	0.63	elliott	0.45	area	0.44
Mammals	*Pteropus poliocephalus*	camera	0.63	area	0.68	thermal	0.62
Mammals	*Rattus fuscipes*	camera	0.63	elliott	0.45	area	0.44
Mammals	*Rattus lutreolus*	camera	0.63	elliott	0.45	area	0.44
Mammals	*Sminthopsis fuliginosus aitkeni*	camera	0.05				
Mammals	*Sminthopsis leucopus*	camera	0.54	elliot	0.44		
Mammals	*Tachyglossus aculeatus multiaculeatus*	camera	0.63	area	0.68	thermal	0.62
Mammals	*Thylogale thetis*	camera	0.63	area	0.68	thermal	0.62
Mammals	*Trichosurus caninus*	camera	0.63	area	0.68	thermal	0.62
Mammals	*Vombatus ursinus*	camera	0.63	area	0.68	thermal	0.62
Mammals	*Wallabia bicolor*	camera	0.63	area	0.68	thermal	0.62
Bats	*Chalinolobus dwyeri*	harp	0.13	autoacoustic	0.13	acoustic	0.32
Bats	*Falsistrellus tasmaniensis*	harp	0.13	autoacoustic	0.13	acoustic	0.32
Bats	*Nyctophilus gouldi*	harp	0.13	autoacoustic	0.13		
Bats	*Phoniscus papuensis*	harp	0.13	autoacoustic	0.13		
Bats	*Rhinolophus megaphyllus*	harp	0.13	autoacoustic	0.13	acoustic	0.32
Bats	*Scoteanax rueppellii*	harp	0.13	autoacoustic	0.13		
Bats	*Scotorepens orion*	harp	0.13	autoacoustic	0.13		
Bats	*Vespadelus darlingtoni*	harp	0.13	autoacoustic	0.13		
Bats	*Vespadelus pumilus*	harp	0.13	autoacoustic	0.13		
Bats	*Vespadelus regulus*	harp	0.13	autoacoustic	0.13		
Frogs	*Adelotus brevis*	spotlight	0.25	tadpole	0.25		
Frogs	*Assa darlingtoni*	spotlight	0.25	tadpole	0.25		
Frogs	*Crinia tinnula*	area	0.44	acoustic	0.44		
Frogs	*Geocrinia victoriana*	area	0.44	acoustic	0.44		
Frogs	*Heleioporus australiacus*	spotlight	0.44	tadpole	0.44	autoacoustic	0.54
Frogs	*Lechriodus fletcheri*	spotlight	0.44	tadpole	0.44		
Frogs	*Litoria aurea*	spotlight	0.44	tadpole	0.44		
Frogs	*Litoria barringtonensis*	spotlight	0.44	tadpole	0.44		
Frogs	*Litoria booroolongensis*	spotlight	0.44	tadpole	0.44		
Frogs	*Litoria brevipalmata*	spotlight	0.44	tadpole	0.44		0

		Method 1		Method 2		Method 3	
Group	Species	Survey Type	Detection Estimate	Survey Type	Detection Estimate	Survey Type	Detection Estimate
Frogs	*Litoria citropa*	spotlight	0.44	tadpole	0.44		0
Frogs	*Litoria dentata*	spotlight	0.44	tadpole	0.44		0
Frogs	*Litoria jervisiensis*	spotlight	0.44	tadpole	0.44		0
Frogs	*Litoria lesueuri*	spotlight	0.44	tadpole	0.44		0
Frogs	*Litoria littlejohni*	spotlight	0.44	tadpole	0.44		0
Frogs	*Litoria nudidigita*	spotlight	0.44	tadpole	0.44		0
Frogs	*Litoria olongburensis*	spotlight	0.44	tadpole	0.44		0
Frogs	*Litoria phyllochroa*	spotlight	0.44	tadpole	0.44		0
Frogs	*Litoria revelata*	spotlight	0.44	tadpole	0.44		0
Frogs	*Litoria spenceri*	spotlight	0.44	tadpole	0.44		0
Frogs	*Litoria subglandulosa*	spotlight	0.44	tadpole	0.44		0
Frogs	*Litoria verreauxii alpina*	spotlight	0.44	tadpole	0.44		0
Frogs	*Mixophyes balbus*	spotlight	0.44	tadpole	0.44		0
Frogs	*Mixophyes fleayi*	spotlight	0.44	tadpole	0.44		0
Frogs	*Mixophyes iteratus*	spotlight	0.44	tadpole	0.44		0
Frogs	*Paracrinia haswelli*	spotlight	0.44	tadpole	0.44		0
Frogs	*Philoria kundagungan*	spotlight	0.44	tadpole	0.44		0
Frogs	*Philoria pughi*	spotlight	0.44	tadpole	0.44		0
Frogs	*Pseudophryne australis*	spotlight	0.44	tadpole	0.44		0
Frogs	*Pseudophryne coriacea*	spotlight	0.44	tadpole	0.44		0
Frogs	*Pseudophryne corroboree*	spotlight	0.44	tadpole	0.44		0
Frogs	*Pseudophryne dendyi*	spotlight	0.44	tadpole	0.44		0
Frogs	*Pseudophryne pengilleyi*	spotlight	0.44	tadpole	0.44		0
Frogs	*Uperoleia fusca*	spotlight	0.44	tadpole	0.44		0
Frogs	*Uperoleia mahonyi*	spotlight	0.44	tadpole	0.44		0
Frogs	*Uperoleia martini*	spotlight	0.44	tadpole	0.44		0
Frogs	*Uperoleia tyleri*	spotlight	0.44	tadpole	0.44		0

Appendix 2: Sampling effort (i.e. number of days/nights spent surveying a site) per detection method

Group	Method1	Method2	Method3
Frogs	4	4	8
Bats	16	16	6
Birds	5	4	10
Mammals	3	4	2
Reptiles	2	4	2

Appendix 3: Survey costs

Financial costs of each method utilised within the analysis. Units costs are set to $0 if surveys are conducted by a fully equipped organisation. Survey duration is based on estimates from published guidelines and grey literature. All values are in Australian dollars.

Detection method	Survey duration (minutes)	Hourly rate (AU)	Unit	Unit cost
Acoustic survey	160	60	1	300
Active search	360	60	0	0
Arboreal camera	2.25	60	9	900
Automated acoustic monitor	45	60	5	1200
Cage traps	150	60	10	40
Cover trap	165	60	20	4
Detection dog	480	125	0	0
Electrofishing	240	60	1	1500
Elliott/Sherman trap	135	60	10	30
Environmental DNA	120	60	2	80
Fyke net survey	120	60	3	300
Ground count survey	60	60	0	0
Hair tube survey	45	60	10	17
Handheld thermal camera survey	240	60	1	1100
Harp trap	60	60	2	2000
Mist net trap	60	60	2	150
Motion trigger camera trap	75	60	9	900
Nest box count survey	120	60	10	60
Pitfall trap	195	60	10	15
Point count survey	240	60	0	0
Spotlight survey	240	60	1	600
Tapdole dipnet survey	120	60	1	15
Taxonomic ID	60	60	0	0
Track and sign survey	240	60	0	0

Appendix 4: Power estimates for alternative budget scenarios

Table 1: *Power to detect population recovery to a proportion of pre-fire levels with a total monitoring budget of $1M AUD over 10 years.*

Group	Species	0.1	0.3	0.5	0.7	0.9
Frogs	*Adelotus_brevis*	0.04	0.06	0.18	0.16	0.26
Frogs	*Assa_darlingtoni*	0.00	0.00	0.00	0.09	0.00
Frogs	*Crinia_tinnula*	0.00	0.09	0.14	0.18	0.08
Frogs	*Geocrinia_victoriana*	0.00	0.04	0.00	0.08	0.00
Frogs	*Heleioporus_australiacus*	0.14	0.34	0.26	0.50	0.78
Frogs	*Lechriodus_fletcheri*	0.00	0.17	0.16	0.27	0.12
Frogs	*Litoria_aurea*	0.00	0.02	0.23	0.06	0.18
Frogs	*Litoria_barringtonensis*	0.03	0.00	0.05	0.07	0.09
Frogs	*Litoria_booroolongensis*	0.05	0.05	0.00	0.00	0.00
Frogs	*Litoria_brevipalmata*	0.04	0.06	0.14	0.20	0.12
Frogs	*Litoria_citropa*	0.02	0.26	0.30	0.40	0.56
Frogs	*Litoria_dentata*	0.12	0.36	0.52	0.56	0.74
Frogs	*Litoria_jervisiensis*	0.04	0.16	0.29	0.30	0.30
Frogs	*Litoria_lesueuri*	0.04	0.30	0.60	0.62	0.68
Frogs	*Litoria_littlejohni*	0.00	0.00	0.15	0.10	0.17
Frogs	*Litoria_nudidigita*	0.02	0.06	0.10	0.30	0.42
Frogs	*Litoria_olongburensis*	0.00	0.11	0.08	0.07	0.03
Frogs	*Litoria_phyllochroa*	0.02	0.18	0.46	0.48	0.60
Frogs	*Litoria_revelata*	0.04	0.16	0.10	0.12	0.16
Frogs	*Litoria_spenceri*	0.00	0.00	0.00	0.00	0.00
Frogs	*Litoria_subglandulosa*	0.00	0.00	0.00	0.00	0.00
Frogs	*Litoria_verreauxii_alpina*	0.00	0.07	0.00	0.00	0.00
Frogs	*Mixophyes_balbus*	0.02	0.04	0.08	0.18	0.12
Frogs	*Mixophyes_fleayi*	0.00	0.03	0.00	0.00	0.04
Frogs	*Mixophyes_iteratus*	0.02	0.02	0.04	0.09	0.14
Frogs	*Paracrinia_haswelli*	0.08	0.20	0.36	0.34	0.60
Frogs	*Philoria_kundagungan*	0.00	0.07	0.05	0.00	0.07
Frogs	*Philoria_pughi*	0.00	0.00	0.00	0.00	0.07
Frogs	*Pseudophryne_australis*	0.02	0.22	0.32	0.26	0.56
Frogs	*Pseudophryne_coriacea*	0.06	0.38	0.30	0.54	0.56
Frogs	*Pseudophryne_corroboree*	0.00	0.00	0.00	0.00	0.00
Frogs	*Pseudophryne_dendyi*	0.03	0.00	0.07	0.12	0.12
Frogs	*Pseudophryne_pengilleyi*	0.06	0.00	0.15	0.00	0.00
Frogs	*Uperoleia_fusca*	0.11	0.18	0.46	0.64	0.68
Frogs	*Uperoleia_mahonyi*	0.04	0.00	0.00	0.00	0.00
Frogs	*Uperoleia_martini*	0.00	0.00	0.00	0.00	0.09
Frogs	*Uperoleia_tyleri*	0.02	0.18	0.22	0.20	0.36
Birds	*Anthochaera_phrygia*	0.00	0.00	0.00	0.00	0.00
Birds	*Atrichornis_rufescens*	0.00	0.00	0.00	0.00	0.00
Birds	*Callocephalon_fimbriatum*	0.00	0.03	0.00	0.03	0.02
Birds	*Calyptorhynchus_lathami_halmaturinus*	0.00	0.00	0.00	0.00	0.00
Birds	*Calyptorhynchus_lathami_lathami*	0.00	0.00	0.00	0.00	0.03
Birds	*Climacteris_erythrops*	0.00	0.00	0.03	0.00	0.00
Birds	*Dasyornis_brachypterus*	0.00	0.00	0.00	0.00	0.00

Group	Species	0.1	0.3	0.5	0.7	0.9
Birds	*Menura_alberti*	0.00	0.00	0.00	0.00	0.00
Birds	*Menura_novaehollandiae*	0.00	0.00	0.04	0.00	0.03
Birds	*Monarcha_melanopsis*	0.00	0.00	0.00	0.00	0.00
Birds	*Origma_solitaria*	0.00	0.00	0.00	0.00	0.00
Birds	*Pezoporus_wallicus_wallicus*	0.00	0.00	0.00	0.00	0.03
Birds	*Psophodes_leucogaster_lashmari*	0.11	0.00	0.00	0.00	0.08
Birds	*Pycnoptilus_floccosus*	0.00	0.00	0.00	0.05	0.03
Birds	*Stipiturus_malachurus_halmaturinus*	0.00	0.00	0.00	0.00	0.00
Birds	*Zoothera_lunulata_halmaturina*	0.00	0.05	0.09	0.07	0.10
Mammals	*Acrobates_pygmaeus*	0.18	0.28	0.50	0.64	0.80
Mammals	*Aepyprymnus_rufescens*	0.10	0.14	0.26	0.46	0.50
Mammals	*Antechinus_agilis*	0.08	0.28	0.52	0.36	0.60
Mammals	*Antechinus_mimetes*	0.00	0.16	0.24	0.24	0.36
Mammals	*Antechinus_stuartii*	0.10	0.26	0.52	0.66	0.72
Mammals	*Burramys_parvus*	0.06	0.18	0.26	0.18	0.28
Mammals	*Cercartetus_nanus*	0.10	0.32	0.54	0.64	0.74
Mammals	*Dasyurus_maculatus_maculatus*	0.08	0.14	0.26	0.38	0.48
Mammals	*Isoodon_obesulus_obesulus*	0.00	0.05	0.02	0.02	0.05
Mammals	*Mastacomys_fuscus_mordicus*	0.10	0.12	0.06	0.14	0.20
Mammals	*Notamacropus_parma*	0.02	0.02	0.10	0.11	0.23
Mammals	*Notamacropus_rufogriseus*	0.10	0.22	0.40	0.66	0.70
Mammals	*Ornithorhynchus_anatinus*	0.18	0.34	0.48	0.64	0.68
Mammals	*Perameles_nasuta*	0.16	0.30	0.60	0.68	0.80
Mammals	*Petauroides_volans*	0.10	0.20	0.28	0.44	0.64
Mammals	*Petaurus_australis*	0.14	0.32	0.56	0.60	0.72
Mammals	*Petrogale_penicillata*	0.06	0.10	0.28	0.20	0.33
Mammals	*Phascolarctos_cinereus*	0.10	0.42	0.64	0.74	0.90
Mammals	*Potorous_longipes*	0.06	0.03	0.03	0.02	0.05
Mammals	*Pseudomys_fumeus*	0.00	0.06	0.18	0.14	0.20
Mammals	*Pseudomys_novaehollandiae*	0.02	0.16	0.15	0.40	0.40
Mammals	*Pseudomys_oralis*	0.02	0.10	0.10	0.12	0.19
Mammals	*Pteropus_poliocephalus*	0.04	0.28	0.32	0.64	0.56
Mammals	*Rattus_fuscipes*	0.20	0.44	0.66	0.78	0.90
Mammals	*Rattus_lutreolus*	0.08	0.28	0.38	0.50	0.56
Mammals	*Sminthopsis_fuliginosus_aitkeni*	0.08	0.00	0.17	0.00	0.10
Mammals	*Sminthopsis_leucopus*	0.04	0.03	0.03	0.02	0.03
Mammals	*Tachyglossus_aculeatus_multiaculeatus*	0.05	0.05	0.00	0.00	0.00
Mammals	*Thylogale_thetis*	0.00	0.14	0.18	0.46	0.50
Mammals	*Trichosurus_caninus*	0.10	0.22	0.48	0.70	0.70
Mammals	*Vombatus_ursinus*	0.08	0.38	0.62	0.70	0.76
Mammals	*Wallabia_bicolor*	0.14	0.44	0.66	0.70	0.88
Reptiles	*Amalosia_lesueurii*	0.00	0.00	0.00	0	0.00
Reptiles	*Austrelaps_labialis*	0.00	0.00	0.03	0.03	0.03
Reptiles	*Austrelaps_ramsayi*	0.05	0.00	0.03	0.06	0.03
Reptiles	*Calyptotis_ruficauda*	0.00	0.00	0.09	0	0.00
Reptiles	*Carinascincus_coventryi*	0.00	0.03	0.02	0.07	0.11
Reptiles	*Coeranoscincus_reticulatus*	0.00	0.00	0.00	0	0.00
Reptiles	*Cyclodomorphus_michaeli*	0.00	0.00	0.03	0.06	0.00

Group	Species	0.1	0.3	0.5	0.7	0.9
Reptiles	*Cyclodomorphus_praealtus*	0.00	0.00	0.00	0	0.00
Reptiles	*Drysdalia_rhodogaster*	0.00	0.00	0.00	0	0.00
Reptiles	*Egernia_mcpheei*	0.00	0.00	0.00	0	0.00
Reptiles	*Eulamprus_heatwolei*	0.00	0.04	0.16	0.16	0.21
Reptiles	*Eulamprus_leuraensis*	0.00	0.00	0.00	0	0.00
Reptiles	*Eulamprus_tympanum*	0.06	0.00	0.00	0.04	0.07
Reptiles	*Harrisoniascincus_zia*	0.00	0.00	0.00	0	0.00
Reptiles	*Hoplocephalus_bungaroides*	0.00	0.00	0.00	NA	0.00
Reptiles	*Liopholis_guthega*	0.00	0.00	0.00	0	0.00
Reptiles	*Lissolepis_coventryi*	0.00	0.00	0.02	0.09	0.04
Reptiles	*Myuchelys_purvisi*	0.00	0.00	0.00	0	0.00
Reptiles	*Phyllurus_platurus*	0.00	0.00	0.00	0	0.00
Reptiles	*Pseudemoia_cryodroma*	0.00	0.00	0.00	0.04	0.00
Reptiles	*Pseudemoia_rawlinsoni*	0.00	0.00	0.02	0.02	0.02
Reptiles	*Saproscincus_mustelinus*	0.00	0.07	0.04	0.06	0.10
Reptiles	*Saproscincus_rosei*	0.00	0.00	0.00	0	0.00
Reptiles	*Saproscincus_spectabilis*	0.00	0.00	0.00	0	0.00
Bats	*Chalinolobus_dwyeri*	0.00	0.02	0.04	0.08	0.19
Bats	*Falsistrellus_tasmaniensis*	0.00	0.02	0.06	0.04	0.08
Bats	*Nyctophilus_gouldi*	0.00	0.02	0.09	0.16	0.06
Bats	*Phoniscus_papuensis*	0.00	0.00	0.02	0.02	0.00
Bats	*Rhinolophus_megaphyllus*	0.02	0.12	0.08	0.10	0.12
Bats	*Scoteanax_rueppellii*	0.00	0.04	0.04	0.14	0.12
Bats	*Scotorepens_orion*	0.00	0.04	0.10	0.12	0.06
Bats	*Vespadelus_darlingtoni*	0.02	0.02	0.06	0.08	0.10
Bats	*Vespadelus_pumilus*	0.00	0.05	0.07	0.04	0.17
Bats	*Vespadelus_regulus*	0.00	0.04	0.02	0.08	0.08

Table 2: Power to detect population recovery to a proportion of pre-fire levels with a total monitoring budget of $10 M AUD over 10 years.

Group	Species	0.1	0.3	0.5	0.7	0.9
Frogs	*Adelotus_brevis*	0.24	0.48	0.68	0.88	0.94
Frogs	*Assa_darlingtoni*	0.07	0.03	0.15	0.12	0.16
Frogs	*Crinia_tinnula*	0.14	0.46	0.56	0.80	0.70
Frogs	*Geocrinia_victoriana*	0.12	0.09	0.30	0.28	0.34
Frogs	*Heleioporus_australiacus*	0.22	0.64	0.72	0.80	1.00
Frogs	*Lechriodus_fletcheri*	0.10	0.42	0.46	0.62	0.66
Frogs	*Litoria_aurea*	0.20	0.40	0.58	0.72	0.80
Frogs	*Litoria_barringtonensis*	0.16	0.32	0.40	0.36	0.36
Frogs	*Litoria_booroolongensis*	0.02	0.11	0.15	0.10	0.16
Frogs	*Litoria_brevipalmata*	0.20	0.52	0.64	0.90	0.88
Frogs	*Litoria_citropa*	0.16	0.56	0.66	0.80	0.88
Frogs	*Litoria_dentata*	0.48	0.90	0.96	1.00	1.00
Frogs	*Litoria_jervisiensis*	0.26	0.48	0.68	0.72	0.90
Frogs	*Litoria_lesueuri*	0.52	0.96	1.00	1.00	1.00
Frogs	*Litoria_littlejohni*	0.08	0.20	0.20	0.24	0.32
Frogs	*Litoria_nudidigita*	0.14	0.60	0.72	0.80	0.94
Frogs	*Litoria_olongburensis*	0.10	0.10	0.40	0.54	0.46
Frogs	*Litoria_phyllochroa*	0.24	0.80	0.92	0.98	1.00
Frogs	*Litoria_revelata*	0.26	0.52	0.78	0.86	0.90
Frogs	*Litoria_spenceri*	0.04	0.04	0.10	0.29	0.28
Frogs	*Litoria_subglandulosa*	0.00	0.11	0.15	0.00	0.00
Frogs	*Litoria_verreauxii_alpina*	0.10	0.26	0.46	0.52	0.68
Frogs	*Mixophyes_balbus*	0.18	0.28	0.30	0.54	0.66
Frogs	*Mixophyes_fleayi*	0.11	0.18	0.20	0.17	0.29
Frogs	*Mixophyes_iteratus*	0.18	0.22	0.50	0.56	0.56
Frogs	*Paracrinia_haswelli*	0.18	0.52	0.82	0.90	1.00
Frogs	*Philoria_kundagungan*	0.14	0.07	0.07	0.10	0.13
Frogs	*Philoria_pughi*	0.09	0.05	0.08	0.07	0.08
Frogs	*Pseudophryne_australis*	0.22	0.36	0.58	0.60	0.84
Frogs	*Pseudophryne_coriacea*	0.36	0.76	0.90	1.00	1.00
Frogs	*Pseudophryne_corroboree*	0.05	0.10	0.10	0.18	0.33
Frogs	*Pseudophryne_dendyi*	0.14	0.34	0.58	0.74	0.96
Frogs	*Pseudophryne_pengilleyi*	0.10	0.14	0.14	0.32	0.34
Frogs	*Uperoleia_fusca*	0.38	0.82	0.96	1.00	1.00
Frogs	*Uperoleia_mahonyi*	0.05	0.02	0.04	0.10	0.00
Frogs	*Uperoleia_martini*	0.00	0.07	0.07	0.21	0.07
Frogs	*Uperoleia_tyleri*	0.20	0.46	0.52	0.70	0.86
Birds	*Anthochaera_phrygia*	0.08	0.16	0.28	0.42	0.50
Birds	*Atrichornis_rufescens*	0.00	0.00	0.04	0.00	0.08
Birds	*Callocephalon_fimbriatum*	0.08	0.24	0.56	0.44	0.64
Birds	*Calyptorhynchus_lathami_halmaturinus*	0.04	0.09	0.03	0.08	0.13
Birds	*Calyptorhynchus_lathami_lathami*	0.14	0.24	0.38	0.38	0.72
Birds	*Climacteris_erythrops*	0.08	0.28	0.40	0.48	0.60
Birds	*Dasyornis_brachypterus*	0.05	0.04	0.07	0.08	0.04
Birds	*Menura_alberti*	0.05	0.05	0.05	0.05	0.13
Birds	*Menura_novaehollandiae*	0.10	0.22	0.32	0.54	0.60
Birds	*Monarcha_melanopsis*	0.13	0.30	0.32	0.56	0.64

Group	Species	0.1	0.3	0.5	0.7	0.9
Birds	*Origma_solitaria*	0.04	0.30	0.54	0.68	0.68
Birds	*Pezoporus_wallicus_wallicus*	0.12	0.16	0.18	0.36	0.38
Birds	*Psophodes_leucogaster_lashmari*	0.00	0.03	0.00	0.03	0.05
Birds	*Pycnoptilus_floccosus*	0.06	0.32	0.34	0.46	0.68
Birds	*Stipiturus_malachurus_halmaturinus*	0.00	0.06	0.06	0.04	0.04
Birds	*Zoothera_lunulata_halmaturina*	0.00	0.03	0.09	0.16	0.05
Mammals	*Acrobates_pygmaeus*	0.72	1.00	1.00	1.00	1.00
Mammals	*Aepyprymnus_rufescens*	0.14	0.48	0.74	0.94	0.98
Mammals	*Antechinus_agilis*	0.52	0.94	1.00	1.00	1.00
Mammals	*Antechinus_mimetes*	0.44	0.86	0.94	1.00	1.00
Mammals	*Antechinus_stuartii*	0.58	0.94	1.00	1.00	1.00
Mammals	*Burramys_parvus*	0.14	0.44	0.76	0.90	0.88
Mammals	*Cercartetus_nanus*	0.58	0.96	1.00	1.00	1.00
Mammals	*Dasyurus_maculatus_maculatus*	0.42	0.94	0.96	1.00	1.00
Mammals	*Isoodon_obesulus_obesulus*	0.32	0.68	0.90	0.98	0.96
Mammals	*Mastacomys_fuscus_mordicus*	0.18	0.42	0.54	0.70	0.80
Mammals	*Notamacropus_parma*	0.08	0.54	0.72	0.82	0.88
Mammals	*Notamacropus_rufogriseus*	0.56	0.92	1.00	1.00	1.00
Mammals	*Ornithorhynchus_anatinus*	0.54	0.96	1.00	1.00	1.00
Mammals	*Perameles_nasuta*	0.72	1.00	1.00	1.00	1.00
Mammals	*Petauroides_volans*	0.60	0.96	1.00	1.00	1.00
Mammals	*Petaurus_australis*	0.68	1.00	1.00	1.00	1.00
Mammals	*Petrogale_penicillata*	0.18	0.52	0.74	0.88	0.96
Mammals	*Phascolarctos_cinereus*	0.68	0.98	1.00	1.00	1.00
Mammals	*Potorous_longipes*	0.16	0.68	0.76	0.90	0.96
Mammals	*Pseudomys_fumeus*	0.14	0.36	0.58	0.90	0.84
Mammals	*Pseudomys_novaehollandiae*	0.30	0.50	0.74	0.92	0.98
Mammals	*Pseudomys_oralis*	0.12	0.44	0.60	0.78	0.80
Mammals	*Pteropus_poliocephalus*	0.44	0.82	1.00	1.00	1.00
Mammals	*Rattus_fuscipes*	0.70	1.00	1.00	1.00	1.00
Mammals	*Rattus_lutreolus*	0.78	0.94	1.00	1.00	1.00
Mammals	*Sminthopsis_fuliginosus_aitkeni*	0.23	0.05	0.05	0.06	0.14
Mammals	*Sminthopsis_leucopus*	0.26	0.74	0.92	0.94	1.00
Mammals	*Tachyglossus_aculeatus_multiaculeatus*	0.00	0.08	0.25	0.32	0.42
Mammals	*Thylogale_thetis*	0.12	0.52	0.72	0.90	0.98
Mammals	*Trichosurus_caninus*	0.74	0.94	1.00	1.00	1.00
Mammals	*Vombatus_ursinus*	0.76	1.00	1.00	1.00	1.00
Mammals	*Wallabia_bicolor*	0.64	1.00	1.00	1.00	1.00
Reptiles	*Amalosia_lesueurii*	0.00	0.11	0.09	0.07	0.10
Reptiles	*Austrelaps_labialis*	0.20	0.26	0.44	0.56	0.56
Reptiles	*Austrelaps_ramsayi*	0.10	0.16	0.27	0.34	0.48
Reptiles	*Calyptotis_ruficauda*	0.12	0.07	0.13	0.05	0.31
Reptiles	*Carinascincus_coventryi*	0.12	0.20	0.48	0.64	0.56
Reptiles	*Coeranoscincus_reticulatus*	0.03	0.11	0.10	0.08	0.03
Reptiles	*Cyclodomorphus_michaeli*	0.08	0.22	0.28	0.52	0.62
Reptiles	*Cyclodomorphus_praealtus*	0.08	0.05	0.02	0.03	0.03
Reptiles	*Drysdalia_rhodogaster*	0.14	0.00	0.10	0.12	0.00
Reptiles	*Egernia_mcpheei*	0.03	0.07	0.00	0.00	0.05

Group	Species	0.1	0.3	0.5	0.7	0.9
Reptiles	*Eulamprus_heatwolei*	0.30	0.72	0.88	0.98	0.94
Reptiles	*Eulamprus_leuraensis*	0.08	0.09	0.03	0.19	0.33
Reptiles	*Eulamprus_tympanum*	0.04	0.06	0.18	0.22	0.26
Reptiles	*Harrisoniascincus_zia*	0.08	0.13	0.15	0.09	0.10
Reptiles	*Hoplocephalus_bungaroides*	0.33	0.00	0.00	0.00	0.50
Reptiles	*Liopholis_guthega*	0.06	0.00	0.00	0.06	0.12
Reptiles	*Lissolepis_coventryi*	0.16	0.46	0.76	0.82	0.88
Reptiles	*Myuchelys_purvisi*	0.05	0.06	0.00	0.18	0.28
Reptiles	*Phyllurus_platurus*	0.10	0.07	0.13	0.08	0.05
Reptiles	*Pseudemoia_cryodroma*	0.07	0.09	0.13	0.07	0.10
Reptiles	*Pseudemoia_rawlinsoni*	0.18	0.42	0.58	0.78	0.74
Reptiles	*Saproscincus_mustelinus*	0.12	0.50	0.62	0.86	0.88
Reptiles	*Saproscincus_rosei*	0.00	0.12	0.07	0.00	0.00
Reptiles	*Saproscincus_spectabilis*	0.09	0.12	0.16	0.08	0.09
Bats	*Chalinolobus_dwyeri*	0.28	0.56	0.64	0.90	0.98
Bats	*Falsistrellus_tasmaniensis*	0.16	0.58	0.70	0.84	0.94
Bats	*Nyctophilus_gouldi*	0.18	0.48	0.76	0.88	0.94
Bats	*Phoniscus_papuensis*	0.12	0.28	0.38	0.48	0.56
Bats	*Rhinolophus_megaphyllus*	0.18	0.58	0.70	0.84	0.96
Bats	*Scoteanax_rueppellii*	0.16	0.58	0.72	0.84	0.94
Bats	*Scotorepens_orion*	0.24	0.46	0.72	0.84	1.00
Bats	*Vespadelus_darlingtoni*	0.14	0.50	0.80	0.86	1.00
Bats	*Vespadelus_pumilus*	0.10	0.46	0.74	0.70	0.82
Bats	*Vespadelus_regulus*	0.14	0.54	0.74	0.84	0.98

Table 3: *Power to detect population recovery to a proportion of pre-fire levels with a total monitoring budget of $25 M AUD over 10 years.*

Group	Species	0.1	0.3	0.5	0.7	0.9
Frogs	*Adelotus_brevis*	0.26	0.74	0.98	0.98	1.00
Frogs	*Assa_darlingtoni*	0.06	0.26	0.31	0.33	0.44
Frogs	*Crinia_tinnula*	0.10	0.44	0.62	0.86	0.92
Frogs	*Geocrinia_victoriana*	0.18	0.68	0.90	0.94	0.96
Frogs	*Heleioporus_australiacus*	0.32	0.62	0.96	0.92	1.00
Frogs	*Lechriodus_fletcheri*	0.18	0.76	0.86	0.94	0.96
Frogs	*Litoria_aurea*	0.18	0.58	0.86	0.88	0.94
Frogs	*Litoria_barringtonensis*	0.24	0.58	0.76	0.94	0.94
Frogs	*Litoria_booroolongensis*	0.08	0.14	0.14	0.34	0.40
Frogs	*Litoria_brevipalmata*	0.31	0.60	0.78	0.94	0.94
Frogs	*Litoria_citropa*	0.46	0.80	0.96	1.00	0.98
Frogs	*Litoria_dentata*	0.58	0.98	1.00	1.00	1.00
Frogs	*Litoria_jervisiensis*	0.26	0.64	0.78	0.84	0.90
Frogs	*Litoria_lesueuri*	0.80	0.98	1.00	1.00	1.00
Frogs	*Litoria_littlejohni*	0.12	0.48	0.66	0.86	0.92
Frogs	*Litoria_nudidigita*	0.44	0.88	0.96	1.00	1.00
Frogs	*Litoria_olongburensis*	0.10	0.14	0.28	0.50	0.54
Frogs	*Litoria_phyllochroa*	0.46	0.98	1.00	1.00	1.00
Frogs	*Litoria_revelata*	0.16	0.80	0.92	0.96	1.00
Frogs	*Litoria_spenceri*	0.14	0.14	0.24	0.32	0.66
Frogs	*Litoria_subglandulosa*	0.14	0.12	0.16	0.31	0.44
Frogs	*Litoria_verreauxii_alpina*	0.08	0.44	0.72	0.80	0.90
Frogs	*Mixophyes_balbus*	0.22	0.60	0.76	0.98	0.96
Frogs	*Mixophyes_fleayi*	0.08	0.24	0.24	0.34	0.40
Frogs	*Mixophyes_iteratus*	0.10	0.52	0.64	0.80	0.94
Frogs	*Paracrinia_haswelli*	0.42	0.86	1.00	1.00	1.00
Frogs	*Philoria_kundagungan*	0.18	0.18	0.24	0.38	0.26
Frogs	*Philoria_pughi*	0.04	0.18	0.10	0.27	0.16
Frogs	*Pseudophryne_australis*	0.14	0.40	0.64	0.74	0.96
Frogs	*Pseudophryne_coriacea*	0.50	1.00	1.00	1.00	1.00
Frogs	*Pseudophryne_corroboree*	0.16	0.08	0.33	0.30	0.33
Frogs	*Pseudophryne_dendyi*	0.30	0.92	0.98	1.00	1.00
Frogs	*Pseudophryne_pengilleyi*	0.06	0.26	0.42	0.34	0.56
Frogs	*Uperoleia_fusca*	0.62	0.96	1.00	1.00	1.00
Frogs	*Uperoleia_mahonyi*	0.06	0.09	0.03	0.05	0.15
Frogs	*Uperoleia_martini*	0.16	0.12	0.22	0.18	0.20
Frogs	*Uperoleia_tyleri*	0.12	0.56	0.84	0.90	0.98
Birds	*Anthochaera_phrygia*	0.10	0.48	0.56	0.74	0.84
Birds	*Atrichornis_rufescens*	0.03	0.03	0.05	0.10	0.03
Birds	*Callocephalon_fimbriatum*	0.22	0.62	0.72	0.98	0.96
Birds	*Calyptorhynchus_lathami_halmaturinus*	0.02	0.13	0.26	0.26	0.47
Birds	*Calyptorhynchus_lathami_lathami*	0.28	0.64	0.76	0.86	0.96
Birds	*Climacteris_erythrops*	0.14	0.56	0.62	0.74	0.78
Birds	*Dasyornis_brachypterus*	0.02	0.06	0.13	0.21	0.13
Birds	*Menura_alberti*	0.11	0.16	0.30	0.12	0.19
Birds	*Menura_novaehollandiae*	0.22	0.58	0.70	0.88	0.88

Group	Species	0.1	0.3	0.5	0.7	0.9
Birds	*Monarcha_melanopsis*	0.18	0.54	0.68	0.88	0.98
Birds	*Origma_solitaria*	0.26	0.50	0.64	0.80	0.86
Birds	*Pezoporus_wallicus_wallicus*	0.16	0.34	0.60	0.68	0.70
Birds	*Psophodes_leucogaster_lashmari*	0.07	0.09	0.06	0.08	0.20
Birds	*Pycnoptilus_floccosus*	0.18	0.58	0.72	0.76	0.88
Birds	*Stipiturus_malachurus_halmaturinus*	0.18	0.20	0.38	0.40	0.56
Birds	*Zoothera_lunulata_halmaturina*	0.09	0.22	0.34	0.39	0.62
Mammals	*Acrobates_pygmaeus*	0.86	1.00	1.00	1.00	1.00
Mammals	*Aepyprymnus_rufescens*	0.36	0.90	1.00	1.00	1.00
Mammals	*Antechinus_agilis*	0.76	1.00	1.00	1.00	1.00
Mammals	*Antechinus_mimetes*	0.56	0.96	1.00	1.00	1.00
Mammals	*Antechinus_stuartii*	0.72	1.00	1.00	1.00	1.00
Mammals	*Burramys_parvus*	0.26	0.40	0.68	0.86	0.94
Mammals	*Cercartetus_nanus*	0.86	1.00	1.00	1.00	1.00
Mammals	*Dasyurus_maculatus_maculatus*	0.52	1.00	1.00	1.00	1.00
Mammals	*Isoodon_obesulus_obesulus*	0.48	0.98	1.00	1.00	1.00
Mammals	*Mastacomys_fuscus_mordicus*	0.14	0.44	0.70	0.84	0.94
Mammals	*Notamacropus_parma*	0.22	0.72	0.88	0.98	1.00
Mammals	*Notamacropus_rufogriseus*	0.82	1.00	1.00	1.00	1.00
Mammals	*Ornithorhynchus_anatinus*	0.80	1.00	1.00	1.00	1.00
Mammals	*Perameles_nasuta*	0.84	1.00	1.00	1.00	1.00
Mammals	*Petauroides_volans*	0.70	1.00	1.00	1.00	1.00
Mammals	*Petaurus_australis*	0.86	1.00	1.00	1.00	1.00
Mammals	*Petrogale_penicillata*	0.22	0.86	0.98	1.00	1.00
Mammals	*Phascolarctos_cinereus*	0.88	1.00	1.00	1.00	1.00
Mammals	*Potorous_longipes*	0.20	0.68	0.82	0.98	1.00
Mammals	*Pseudomys_fumeus*	0.08	0.56	0.72	1.00	0.98
Mammals	*Pseudomys_novaehollandiae*	0.38	0.76	0.94	1.00	0.98
Mammals	*Pseudomys_oralis*	0.30	0.76	0.90	0.98	1.00
Mammals	*Pteropus_poliocephalus*	0.48	0.98	1.00	1.00	1.00
Mammals	*Rattus_fuscipes*	0.96	1.00	1.00	1.00	1.00
Mammals	*Rattus_lutreolus*	0.76	1.00	1.00	1.00	1.00
Mammals	*Sminthopsis_fuliginosus_aitkeni*	0.06	0.35	0.46	0.48	0.78
Mammals	*Sminthopsis_leucopus*	0.42	0.82	0.96	1.00	1.00
Mammals	*Tachyglossus_aculeatus_multiaculeatus*	0.32	0.70	0.76	0.92	0.94
Mammals	*Thylogale_thetis*	0.26	0.88	0.98	1.00	1.00
Mammals	*Trichosurus_caninus*	0.68	0.98	1.00	1.00	1.00
Mammals	*Vombatus_ursinus*	0.88	1.00	1.00	1.00	1.00
Mammals	*Wallabia_bicolor*	0.90	1.00	1.00	1.00	1.00
Reptiles	*Amalosia_lesueurii*	0.10	0.32	0.50	0.58	0.54
Reptiles	*Austrelaps_labialis*	0.18	0.34	0.62	0.70	0.72
Reptiles	*Austrelaps_ramsayi*	0.14	0.52	0.68	0.82	0.96
Reptiles	*Calyptotis_ruficauda*	0.00	0.10	0.08	0.32	0.14
Reptiles	*Carinascincus_coventryi*	0.24	0.46	0.78	0.98	0.90
Reptiles	*Coeranoscincus_reticulatus*	0.08	0.09	0.05	0.02	0.05
Reptiles	*Cyclodomorphus_michaeli*	0.26	0.58	0.68	0.88	0.98
Reptiles	*Cyclodomorphus_praealtus*	0.08	0.13	0.02	0.06	0.09
Reptiles	*Drysdalia_rhodogaster*	0.06	0.26	0.41	0.43	0.53

Group	Species	0.1	0.3	0.5	0.7	0.9
Reptiles	*Egernia_mcpheei*	0.06	0.08	0.10	0.20	0.08
Reptiles	*Eulamprus_heatwolei*	0.48	0.92	1.00	1.00	1.00
Reptiles	*Eulamprus_leuraensis*	0.07	0.11	0.13	0.13	0.16
Reptiles	*Eulamprus_tympanum*	0.14	0.30	0.46	0.64	0.68
Reptiles	*Harrisoniascincus_zia*	0.11	0.11	0.06	0.11	0.17
Reptiles	*Hoplocephalus_bungaroides*	0.03	0.11	0.18	0.22	0.22
Reptiles	*Liopholis_guthega*	0.00	0.03	0.03	0.00	0.05
Reptiles	*Lissolepis_coventryi*	0.20	0.68	0.84	0.94	0.94
Reptiles	*Myuchelys_purvisi*	0.13	0.15	0.19	0.31	0.19
Reptiles	*Phyllurus_platurus*	0.06	0.24	0.33	0.37	0.57
Reptiles	*Pseudemoia_cryodroma*	0.08	0.20	0.29	0.24	0.31
Reptiles	*Pseudemoia_rawlinsoni*	0.14	0.66	0.86	0.96	0.98
Reptiles	*Saproscincus_mustelinus*	0.48	0.90	0.98	0.98	1.00
Reptiles	*Saproscincus_rosei*	0.04	0.14	0.04	0.15	0.11
Reptiles	*Saproscincus_spectabilis*	0.02	0.09	0.17	0.12	0.06
Bats	*Chalinolobus_dwyeri*	0.32	0.82	0.96	1.00	1.00
Bats	*Falsistrellus_tasmaniensis*	0.46	0.94	0.92	1.00	1.00
Bats	*Nyctophilus_gouldi*	0.54	0.80	0.98	1.00	1.00
Bats	*Phoniscus_papuensis*	0.32	0.70	0.78	0.92	0.94
Bats	*Rhinolophus_megaphyllus*	0.44	0.76	0.98	1.00	1.00
Bats	*Scoteanax_rueppellii*	0.32	0.92	0.98	0.98	1.00
Bats	*Scotorepens_orion*	0.42	0.86	0.98	0.98	1.00
Bats	*Vespadelus_darlingtoni*	0.26	0.84	0.96	0.98	1.00
Bats	*Vespadelus_pumilus*	0.30	0.76	0.86	1.00	0.98
Bats	*Vespadelus_regulus*	0.42	0.88	0.98	1.00	1.00

Table 4: Power to detect population recovery to a proportion of pre-fire levels with a total monitoring budget of $50 M AUD over 10 years.

Group	Species	0.1	0.3	0.5	0.7	0.9
Frogs	*Adelotus_brevis*	0.52	1.00	1.00	1.00	1.00
Frogs	*Assa_darlingtoni*	0.18	0.36	0.59	0.68	0.88
Frogs	*Crinia_tinnula*	0.34	0.82	0.98	0.98	1.00
Frogs	*Geocrinia_victoriana*	0.32	0.82	0.92	0.98	1.00
Frogs	*Heleioporus_australiacus*	0.64	0.92	1.00	1.00	1.00
Frogs	*Lechriodus_fletcheri*	0.44	0.98	0.98	1.00	1.00
Frogs	*Litoria_aurea*	0.36	0.90	0.96	1.00	1.00
Frogs	*Litoria_barringtonensis*	0.28	0.94	1.00	1.00	1.00
Frogs	*Litoria_booroolongensis*	0.09	0.26	0.39	0.63	0.68
Frogs	*Litoria_brevipalmata*	0.50	0.96	1.00	1.00	1.00
Frogs	*Litoria_citropa*	0.68	1.00	1.00	1.00	1.00
Frogs	*Litoria_dentata*	0.98	1.00	1.00	1.00	1.00
Frogs	*Litoria_jervisiensis*	0.42	0.96	0.98	1.00	1.00
Frogs	*Litoria_lesueuri*	0.98	1.00	1.00	1.00	1.00
Frogs	*Litoria_littlejohni*	0.24	0.70	0.90	0.98	0.98
Frogs	*Litoria_nudidigita*	0.62	1.00	1.00	1.00	1.00
Frogs	*Litoria_olongburensis*	0.04	0.41	0.62	0.76	0.76
Frogs	*Litoria_phyllochroa*	0.78	1.00	1.00	1.00	1.00
Frogs	*Litoria_revelata*	0.54	0.96	1.00	1.00	1.00
Frogs	*Litoria_spenceri*	0.07	0.20	0.42	0.62	0.61
Frogs	*Litoria_subglandulosa*	0.19	0.42	0.68	0.86	0.74
Frogs	*Litoria_verreauxii_alpina*	0.24	0.56	0.86	0.94	0.94
Frogs	*Mixophyes_balbus*	0.44	0.94	0.98	1.00	1.00
Frogs	*Mixophyes_fleayi*	0.13	0.25	0.50	0.68	0.68
Frogs	*Mixophyes_iteratus*	0.34	0.84	0.96	1.00	1.00
Frogs	*Paracrinia_haswelli*	0.62	1.00	1.00	1.00	1.00
Frogs	*Philoria_kundagungan*	0.12	0.27	0.42	0.64	0.70
Frogs	*Philoria_pughi*	0.07	0.30	0.28	0.46	0.61
Frogs	*Pseudophryne_australis*	0.36	0.88	0.98	1.00	1.00
Frogs	*Pseudophryne_coriacea*	0.90	1.00	1.00	1.00	1.00
Frogs	*Pseudophryne_corroboree*	0.12	0.21	0.30	0.14	0.50
Frogs	*Pseudophryne_dendyi*	0.64	0.96	1.00	1.00	1.00
Frogs	*Pseudophryne_pengilleyi*	0.08	0.27	0.56	0.54	0.72
Frogs	*Uperoleia_fusca*	0.96	1.00	1.00	1.00	1.00
Frogs	*Uperoleia_mahonyi*	0.07	0.07	0.08	0.19	0.05
Frogs	*Uperoleia_martini*	0.02	0.09	0.15	0.24	0.25
Frogs	*Uperoleia_tyleri*	0.42	0.82	0.96	1.00	1.00
Birds	*Anthochaera_phrygia*	0.26	0.62	0.76	0.86	0.98
Birds	*Atrichornis_rufescens*	0.13	0.03	0.11	0.07	0.12
Birds	*Callocephalon_fimbriatum*	0.34	0.80	0.96	0.98	1.00
Birds	*Calyptorhynchus_lathami_halmaturinus*	0.24	0.44	0.68	0.74	0.86
Birds	*Calyptorhynchus_lathami_lathami*	0.22	0.68	0.90	0.98	0.98
Birds	*Climacteris_erythrops*	0.32	0.70	0.76	0.96	1.00
Birds	*Dasyornis_brachypterus*	0.14	0.13	0.13	0.36	0.24
Birds	*Menura_alberti*	0.12	0.25	0.31	0.36	0.44
Birds	*Menura_novaehollandiae*	0.44	0.90	0.84	1.00	1.00
Birds	*Monarcha_melanopsis*	0.32	0.68	0.94	1.00	0.98

Group	Species	0.1	0.3	0.5	0.7	0.9
Birds	*Origma_solitaria*	0.28	0.70	0.86	0.98	0.94
Birds	*Pezoporus_wallicus_wallicus*	0.26	0.46	0.80	0.84	0.92
Birds	*Psophodes_leucogaster_lashmari*	0.14	0.24	0.64	0.44	0.66
Birds	*Pycnoptilus_floccosus*	0.28	0.58	0.94	0.98	0.96
Birds	*Stipiturus_malachurus_halmaturinus*	0.26	0.66	0.98	0.98	0.98
Birds	*Zoothera_lunulata_halmaturina*	0.30	0.50	0.86	0.88	0.92
Mammals	*Acrobates_pygmaeus*	1.00	1.00	1.00	1.00	1.00
Mammals	*Aepyprymnus_rufescens*	0.84	1.00	1.00	1.00	1.00
Mammals	*Antechinus_agilis*	1.00	1.00	1.00	1.00	1.00
Mammals	*Antechinus_mimetes*	0.90	1.00	1.00	1.00	1.00
Mammals	*Antechinus_stuartii*	0.96	1.00	1.00	1.00	1.00
Mammals	*Burramys_parvus*	0.24	0.86	0.98	1.00	1.00
Mammals	*Cercartetus_nanus*	1.00	1.00	1.00	1.00	1.00
Mammals	*Dasyurus_maculatus_maculatus*	0.94	1.00	1.00	1.00	1.00
Mammals	*Isoodon_obesulus_obesulus*	0.86	1.00	1.00	1.00	1.00
Mammals	*Mastacomys_fuscus_mordicus*	0.36	0.86	1.00	1.00	1.00
Mammals	*Notamacropus_parma*	0.38	0.98	0.98	1.00	1.00
Mammals	*Notamacropus_rufogriseus*	1.00	1.00	1.00	1.00	1.00
Mammals	*Ornithorhynchus_anatinus*	1.00	1.00	1.00	1.00	1.00
Mammals	*Perameles_nasuta*	1.00	1.00	1.00	1.00	1.00
Mammals	*Petauroides_volans*	1.00	1.00	1.00	1.00	1.00
Mammals	*Petaurus_australis*	1.00	1.00	1.00	1.00	1.00
Mammals	*Petrogale_penicillata*	0.74	1.00	1.00	1.00	1.00
Mammals	*Phascolarctos_cinereus*	1.00	1.00	1.00	1.00	1.00
Mammals	*Potorous_longipes*	0.54	1.00	1.00	1.00	1.00
Mammals	*Pseudomys_fumeus*	0.44	0.96	1.00	1.00	1.00
Mammals	*Pseudomys_novaehollandiae*	0.38	1.00	0.98	1.00	1.00
Mammals	*Pseudomys_oralis*	0.52	0.98	1.00	1.00	1.00
Mammals	*Pteropus_poliocephalus*	0.94	1.00	1.00	1.00	1.00
Mammals	*Rattus_fuscipes*	1.00	1.00	1.00	1.00	1.00
Mammals	*Rattus_lutreolus*	1.00	1.00	1.00	1.00	1.00
Mammals	*Sminthopsis_fuliginosus_aitkeni*	0.07	0.20	0.39	0.49	0.62
Mammals	*Sminthopsis_leucopus*	0.56	1.00	1.00	1.00	1.00
Mammals	*Tachyglossus_aculeatus_multiaculeatus*	0.12	0.44	0.66	0.96	0.94
Mammals	*Thylogale_thetis*	0.66	1.00	1.00	1.00	1.00
Mammals	*Trichosurus_caninus*	1.00	1.00	1.00	1.00	1.00
Mammals	*Vombatus_ursinus*	1.00	1.00	1.00	1.00	1.00
Mammals	*Wallabia_bicolor*	1.00	1.00	1.00	1.00	1.00
Reptiles	*Amalosia_lesueurii*	0.36	0.80	0.94	0.98	1.00
Reptiles	*Austrelaps_labialis*	0.12	0.40	0.68	0.82	0.88
Reptiles	*Austrelaps_ramsayi*	0.40	0.78	0.98	1.00	1.00
Reptiles	*Calyptotis_ruficauda*	0.06	0.18	0.04	0.19	0.28
Reptiles	*Carinascincus_coventryi*	0.34	0.76	0.98	1.00	1.00
Reptiles	*Coeranoscincus_reticulatus*	0.14	0.00	0.12	0.14	0.10
Reptiles	*Cyclodomorphus_michaeli*	0.36	0.84	1.00	0.98	1.00
Reptiles	*Cyclodomorphus_praealtus*	0.13	0.17	0.15	0.10	0.17
Reptiles	*Drysdalia_rhodogaster*	0.28	0.62	0.86	0.96	1.00

Group	Species	0.1	0.3	0.5	0.7	0.9
Reptiles	*Egernia_mcpheei*	0.14	0.26	0.48	0.56	0.74
Reptiles	*Eulamprus_heatwolei*	0.66	0.98	1.00	1.00	1.00
Reptiles	*Eulamprus_leuraensis*	0.12	0.28	0.50	0.52	0.66
Reptiles	*Eulamprus_tympanum*	0.18	0.54	0.94	0.94	0.96
Reptiles	*Harrisoniascincus_zia*	0.07	0.05	0.03	0.07	0.07
Reptiles	*Hoplocephalus_bungaroides*	0.12	0.28	0.40	0.69	0.70
Reptiles	*Liopholis_guthega*	0.13	0.00	0.04	0.00	0.04
Reptiles	*Lissolepis_coventryi*	0.22	0.76	0.90	0.96	0.98
Reptiles	*Myuchelys_purvisi*	0.09	0.15	0.03	0.06	0.11
Reptiles	*Phyllurus_platurus*	0.24	0.74	0.84	0.90	0.98
Reptiles	*Pseudemoia_cryodroma*	0.04	0.08	0.24	0.35	0.26
Reptiles	*Pseudemoia_rawlinsoni*	0.30	0.64	0.88	0.96	0.96
Reptiles	*Saproscincus_mustelinus*	0.64	1.00	1.00	1.00	1.00
Reptiles	*Saproscincus_rosei*	0.06	0.20	0.18	0.24	0.28
Reptiles	*Saproscincus_spectabilis*	0.06	0.16	0.16	0.32	0.30
Bats	*Chalinolobus_dwyeri*	0.40	0.98	1.00	1.00	1.00
Bats	*Falsistrellus_tasmaniensis*	0.66	0.98	1.00	1.00	1.00
Bats	*Nyctophilus_gouldi*	0.78	1.00	1.00	1.00	1.00
Bats	*Phoniscus_papuensis*	0.30	0.82	1.00	0.98	1.00
Bats	*Rhinolophus_megaphyllus*	0.66	0.96	1.00	1.00	1.00
Bats	*Scoteanax_rueppellii*	0.70	0.98	0.98	1.00	1.00
Bats	*Scotorepens_orion*	0.56	0.98	1.00	1.00	1.00
Bats	*Vespadelus_darlingtoni*	0.62	1.00	1.00	1.00	1.00
Bats	*Vespadelus_pumilus*	0.42	0.92	1.00	1.00	1.00
Bats	*Vespadelus_regulus*	0.66	0.96	1.00	1.00	1.00

Table 5: *Power to detect population recovery to a proportion of pre-fire levels with a total monitoring budget of $75 M AUD over 10 years.*

Group	Species	0.1	0.3	0.5	0.7	0.9
Frogs	*Adelotus_brevis*	0.65	1.00	1.00	1.00	1.00
Frogs	*Assa_darlingtoni*	0.19	0.40	0.62	0.84	0.90
Frogs	*Crinia_tinnula*	0.50	0.92	1.00	1.00	1.00
Frogs	*Geocrinia_victoriana*	0.32	0.94	1.00	1.00	1.00
Frogs	*Heleioporus_australiacus*	0.54	1.00	1.00	1.00	1.00
Frogs	*Lechriodus_fletcheri*	0.58	1.00	1.00	1.00	1.00
Frogs	*Litoria_aurea*	0.46	0.92	1.00	1.00	1.00
Frogs	*Litoria_barringtonensis*	0.54	0.98	1.00	1.00	1.00
Frogs	*Litoria_booroolongensis*	0.04	0.34	0.66	0.72	0.76
Frogs	*Litoria_brevipalmata*	0.56	1.00	1.00	1.00	1.00
Frogs	*Litoria_citropa*	0.78	1.00	1.00	1.00	1.00
Frogs	*Litoria_dentata*	1.00	1.00	1.00	1.00	1.00
Frogs	*Litoria_jervisiensis*	0.48	0.98	0.98	1.00	1.00
Frogs	*Litoria_lesueuri*	0.98	1.00	1.00	1.00	1.00
Frogs	*Litoria_littlejohni*	0.42	0.76	0.94	1.00	1.00
Frogs	*Litoria_nudidigita*	0.64	1.00	1.00	1.00	1.00
Frogs	*Litoria_olongburensis*	0.12	0.44	0.80	0.90	0.90
Frogs	*Litoria_phyllochroa*	0.92	1.00	1.00	1.00	1.00
Frogs	*Litoria_revelata*	0.72	1.00	1.00	1.00	1.00
Frogs	*Litoria_spenceri*	0.06	0.28	0.66	0.74	0.76
Frogs	*Litoria_subglandulosa*	0.16	0.46	0.66	0.90	0.92
Frogs	*Litoria_verreauxii_alpina*	0.20	0.86	0.98	1.00	0.98
Frogs	*Mixophyes_balbus*	0.62	0.98	1.00	1.00	1.00
Frogs	*Mixophyes_fleayi*	0.02	0.32	0.42	0.82	0.86
Frogs	*Mixophyes_iteratus*	0.34	0.90	0.98	0.98	1.00
Frogs	*Paracrinia_haswelli*	0.92	1.00	1.00	1.00	1.00
Frogs	*Philoria_kundagungan*	0.16	0.46	0.66	0.72	0.84
Frogs	*Philoria_pughi*	0.16	0.22	0.60	0.68	0.86
Frogs	*Pseudophryne_australis*	0.42	0.86	0.98	1.00	1.00
Frogs	*Pseudophryne_coriacea*	0.94	1.00	1.00	1.00	1.00
Frogs	*Pseudophryne_corroboree*	0.05	0.33	0.42	0.48	0.64
Frogs	*Pseudophryne_dendyi*	0.82	1.00	1.00	1.00	1.00
Frogs	*Pseudophryne_pengilleyi*	0.08	0.44	0.56	0.74	0.88
Frogs	*Uperoleia_fusca*	1.00	1.00	1.00	1.00	1.00
Frogs	*Uperoleia_mahonyi*	0.24	0.13	0.05	0.15	0.05
Frogs	*Uperoleia_martini*	0.02	0.16	0.16	0.30	0.36
Frogs	*Uperoleia_tyleri*	0.36	0.92	1.00	1.00	1.00
Birds	*Anthochaera_phrygia*	0.24	0.72	0.86	0.96	1.00
Birds	*Atrichornis_rufescens*	0.07	0.18	0.18	0.20	0.20
Birds	*Callocephalon_fimbriatum*	0.48	0.92	1.00	1.00	1.00
Birds	*Calyptorhynchus_lathami_halmaturinus*	0.30	0.52	0.80	0.92	0.96
Birds	*Calyptorhynchus_lathami_lathami*	0.40	0.80	0.98	1.00	1.00
Birds	*Climacteris_erythrops*	0.22	0.80	0.98	1.00	1.00
Birds	*Dasyornis_brachypterus*	0.07	0.13	0.22	0.26	0.22
Birds	*Menura_alberti*	0.13	0.22	0.44	0.46	0.54
Birds	*Menura_novaehollandiae*	0.50	0.86	1.00	1.00	1.00

Birds	*Monarcha_melanopsis*	0.38	0.88	0.98	1.00	1.00
Birds	*Origma_solitaria*	0.32	0.74	0.96	0.98	1.00
Birds	*Pezoporus_wallicus_wallicus*	0.18	0.76	0.90	0.96	0.94
Birds	*Psophodes_leucogaster_lashmari*	0.18	0.38	0.64	0.86	0.84
Birds	*Pycnoptilus_floccosus*	0.32	0.74	0.90	0.94	1.00
Birds	*Stipiturus_malachurus_halmaturinus*	0.20	0.96	0.98	1.00	1.00
Birds	*Zoothera_lunulata_halmaturina*	0.30	0.90	0.98	1.00	1.00
Mammals	*Acrobates_pygmaeus*	1.00	1.00	1.00	1.00	1.00
Mammals	*Aepyprymnus_rufescens*	0.96	1.00	1.00	1.00	1.00
Mammals	*Antechinus_agilis*	1.00	1.00	1.00	1.00	1.00
Mammals	*Antechinus_mimetes*	0.96	1.00	1.00	1.00	1.00
Mammals	*Antechinus_stuartii*	1.00	1.00	1.00	1.00	1.00
Mammals	*Burramys_parvus*	0.38	0.96	1.00	1.00	1.00
Mammals	*Cercartetus_nanus*	1.00	1.00	1.00	1.00	1.00
Mammals	*Dasyurus_maculatus_maculatus*	0.98	1.00	1.00	1.00	1.00
Mammals	*Isoodon_obesulus_obesulus*	0.92	1.00	1.00	1.00	1.00
Mammals	*Mastacomys_fuscus_mordicus*	0.30	0.94	1.00	1.00	1.00
Mammals	*Notamacropus_parma*	0.70	1.00	1.00	1.00	1.00
Mammals	*Notamacropus_rufogriseus*	1.00	1.00	1.00	1.00	1.00
Mammals	*Ornithorhynchus_anatinus*	1.00	1.00	1.00	1.00	1.00
Mammals	*Perameles_nasuta*	1.00	1.00	1.00	1.00	1.00
Mammals	*Petauroides_volans*	1.00	1.00	1.00	1.00	1.00
Mammals	*Petaurus_australis*	1.00	1.00	1.00	1.00	1.00
Mammals	*Petrogale_penicillata*	0.86	1.00	1.00	1.00	1.00
Mammals	*Phascolarctos_cinereus*	1.00	1.00	1.00	1.00	1.00
Mammals	*Potorous_longipes*	0.72	1.00	1.00	1.00	1.00
Mammals	*Pseudomys_fumeus*	0.64	0.98	1.00	1.00	1.00
Mammals	*Pseudomys_novaehollandiae*	0.56	0.98	1.00	1.00	1.00
Mammals	*Pseudomys_oralis*	0.64	1.00	1.00	1.00	1.00
Mammals	*Pteropus_poliocephalus*	1.00	1.00	1.00	1.00	1.00
Mammals	*Rattus_fuscipes*	1.00	1.00	1.00	1.00	1.00
Mammals	*Rattus_lutreolus*	1.00	1.00	1.00	1.00	1.00
Mammals	*Sminthopsis_fuliginosus_aitkeni*	0.06	0.30	0.56	0.80	0.86
Mammals	*Sminthopsis_leucopus*	0.82	1.00	1.00	1.00	1.00
Mammals	*Tachyglossus_aculeatus_multiaculeatus*	0.16	0.78	0.96	0.98	1.00
Mammals	*Thylogale_thetis*	0.78	1.00	1.00	1.00	1.00
Mammals	*Trichosurus_caninus*	1.00	1.00	1.00	1.00	1.00
Mammals	*Vombatus_ursinus*	1.00	1.00	1.00	1.00	1.00
Mammals	*Wallabia_bicolor*	1.00	1.00	1.00	1.00	1.00
Reptiles	*Amalosia_lesueurii*	0.36	0.92	1.00	1.00	1.00
Reptiles	*Austrelaps_labialis*	0.22	0.52	0.60	0.78	0.86
Reptiles	*Austrelaps_ramsayi*	0.46	0.98	1.00	1.00	1.00
Reptiles	*Calyptotis_ruficauda*	0.16	0.26	0.26	0.46	0.48
Reptiles	*Carinascincus_coventryi*	0.46	0.90	1.00	1.00	1.00
Reptiles	*Coeranoscincus_reticulatus*	0.10	0.08	0.10	0.20	0.26
Reptiles	*Cyclodomorphus_michaeli*	0.36	0.88	1.00	1.00	1.00
Reptiles	*Cyclodomorphus_praealtus*	0.10	0.24	0.42	0.46	0.50
Reptiles	*Drysdalia_rhodogaster*	0.26	0.76	0.96	0.98	1.00
Reptiles	*Egernia_mcpheei*	0.16	0.62	0.74	0.88	0.92

Reptiles	*Eulamprus_heatwolei*	0.92	1.00	1.00	1.00	1.00
Reptiles	*Eulamprus_leuraensis*	0.08	0.42	0.50	0.54	0.64
Reptiles	*Eulamprus_tympanum*	0.42	0.86	0.96	1.00	1.00
Reptiles	*Harrisoniascincus_zia*	0.11	0.09	0.07	0.04	0.11
Reptiles	*Hoplocephalus_bungaroides*	0.19	0.26	0.48	0.62	0.80
Reptiles	*Liopholis_guthega*	0.00	0.00	0.10	0.10	0.03
Reptiles	*Lissolepis_coventryi*	0.24	0.64	0.90	1.00	1.00
Reptiles	*Myuchelys_purvisi*	0.06	0.10	0.18	0.21	0.17
Reptiles	*Phyllurus_platurus*	0.32	0.70	0.94	1.00	1.00
Reptiles	*Pseudemoia_cryodroma*	0.10	0.04	0.18	0.28	0.32
Reptiles	*Pseudemoia_rawlinsoni*	0.26	0.80	0.92	1.00	1.00
Reptiles	*Saproscincus_mustelinus*	0.80	1.00	1.00	1.00	1.00
Reptiles	*Saproscincus_rosei*	0.18	0.16	0.34	0.38	0.50
Reptiles	*Saproscincus_spectabilis*	0.06	0.04	0.34	0.40	0.32
Bats	*Chalinolobus_dwyeri*	0.60	1.00	1.00	1.00	1.00
Bats	*Falsistrellus_tasmaniensis*	0.90	1.00	1.00	1.00	1.00
Bats	*Nyctophilus_gouldi*	0.88	1.00	1.00	1.00	1.00
Bats	*Phoniscus_papuensis*	0.50	0.94	1.00	1.00	1.00
Bats	*Rhinolophus_megaphyllus*	0.88	1.00	1.00	1.00	1.00
Bats	*Scoteanax_rueppellii*	0.72	1.00	1.00	1.00	1.00
Bats	*Scotorepens_orion*	0.70	1.00	1.00	1.00	1.00
Bats	*Vespadelus_darlingtoni*	0.80	0.98	1.00	1.00	1.00
Bats	*Vespadelus_pumilus*	0.70	1.00	1.00	1.00	1.00
Bats	*Vespadelus_regulus*	0.78	1.00	1.00	1.00	1.00

Table 6: Power to detect population recovery to a proportion of pre-fire levels with a total monitoring budget of $100 M AUD over 10 years.

Group	Species	0.1	0.3	0.5	0.7	0.9
Frogs	*Adelotus_brevis*	0.83	1.00	1.00	1.00	1.00
Frogs	*Assa_darlingtoni*	0.16	0.47	0.77	0.82	0.89
Frogs	*Crinia_tinnula*	0.48	0.96	1.00	1.00	1.00
Frogs	*Geocrinia_victoriana*	0.44	0.94	1.00	1.00	1.00
Frogs	*Heleioporus_australiacus*	0.78	1.00	1.00	1.00	1.00
Frogs	*Lechriodus_fletcheri*	0.62	1.00	1.00	1.00	1.00
Frogs	*Litoria_aurea*	0.62	0.98	1.00	1.00	1.00
Frogs	*Litoria_barringtonensis*	0.60	0.96	1.00	1.00	1.00
Frogs	*Litoria_booroolongensis*	0.20	0.34	0.76	0.82	0.88
Frogs	*Litoria_brevipalmata*	0.74	1.00	1.00	1.00	1.00
Frogs	*Litoria_citropa*	0.88	1.00	1.00	1.00	1.00
Frogs	*Litoria_dentata*	1.00	1.00	1.00	1.00	1.00
Frogs	*Litoria_jervisiensis*	0.54	1.00	1.00	1.00	1.00
Frogs	*Litoria_lesueuri*	1.00	1.00	1.00	1.00	1.00
Frogs	*Litoria_littlejohni*	0.52	0.92	1.00	0.98	1.00
Frogs	*Litoria_nudidigita*	0.70	1.00	1.00	1.00	1.00
Frogs	*Litoria_olongburensis*	0.18	0.60	0.84	0.94	0.96
Frogs	*Litoria_phyllochroa*	0.96	1.00	1.00	1.00	1.00
Frogs	*Litoria_revelata*	0.90	1.00	1.00	1.00	1.00
Frogs	*Litoria_spenceri*	0.20	0.40	0.64	0.86	0.92
Frogs	*Litoria_subglandulosa*	0.12	0.48	0.86	0.96	0.98
Frogs	*Litoria_verreauxii_alpina*	0.34	0.96	0.96	1.00	1.00
Frogs	*Mixophyes_balbus*	0.66	1.00	1.00	1.00	1.00
Frogs	*Mixophyes_fleayi*	0.20	0.48	0.72	0.76	0.96
Frogs	*Mixophyes_iteratus*	0.46	0.98	1.00	1.00	1.00
Frogs	*Paracrinia_haswelli*	0.94	1.00	1.00	1.00	1.00
Frogs	*Philoria_kundagungan*	0.20	0.40	0.68	0.96	0.88
Frogs	*Philoria_pughi*	0.08	0.28	0.49	0.71	0.82
Frogs	*Pseudophryne_australis*	0.44	0.96	0.98	1.00	1.00
Frogs	*Pseudophryne_coriacea*	0.98	1.00	1.00	1.00	1.00
Frogs	*Pseudophryne_corroboree*	0.12	0.22	0.54	0.64	0.68
Frogs	*Pseudophryne_dendyi*	0.88	1.00	1.00	1.00	1.00
Frogs	*Pseudophryne_pengilleyi*	0.10	0.40	0.62	0.76	0.92
Frogs	*Uperoleia_fusca*	1.00	1.00	1.00	1.00	1.00
Frogs	*Uperoleia_mahonyi*	0.08	0.19	0.26	0.20	0.06
Frogs	*Uperoleia_martini*	0.04	0.18	0.28	0.42	0.56
Frogs	*Uperoleia_tyleri*	0.70	1.00	1.00	1.00	1.00
Birds	*Anthochaera_phrygia*	0.34	0.78	0.94	1.00	1.00
Birds	*Atrichornis_rufescens*	0.10	0.05	0.09	0.17	0.23
Birds	*Callocephalon_fimbriatum*	0.56	0.92	1.00	1.00	1.00
Birds	*Calyptorhynchus_lathami_halmaturinus*	0.29	0.76	0.90	0.98	1.00
Birds	*Calyptorhynchus_lathami_lathami*	0.42	0.92	1.00	1.00	1.00
Birds	*Climacteris_erythrops*	0.52	0.90	0.98	1.00	1.00
Birds	*Dasyornis_brachypterus*	0.10	0.26	0.33	0.27	0.29
Birds	*Menura_alberti*	0.10	0.33	0.41	0.50	0.63

Group	Species	0.1	0.3	0.5	0.7	0.9
Birds	*Menura_novaehollandiae*	0.40	0.92	1.00	1.00	1.00
Birds	*Monarcha_melanopsis*	0.60	0.94	1.00	1.00	1.00
Birds	*Origma_solitaria*	0.40	0.82	0.96	1.00	1.00
Birds	*Pezoporus_wallicus_wallicus*	0.24	0.76	0.96	1.00	0.98
Birds	*Psophodes_leucogaster_lashmari*	0.20	0.60	0.98	0.90	0.94
Birds	*Pycnoptilus_floccosus*	0.32	0.86	1.00	0.98	1.00
Birds	*Stipiturus_malachurus_halmaturinus*	0.54	0.88	1.00	1.00	1.00
Birds	*Zoothera_lunulata_halmaturina*	0.52	0.92	1.00	1.00	1.00
Mammals	*Acrobates_pygmaeus*	1.00	1.00	1.00	1.00	1.00
Mammals	*Aepyprymnus_rufescens*	0.94	1.00	1.00	1.00	1.00
Mammals	*Antechinus_agilis*	1.00	1.00	1.00	1.00	1.00
Mammals	*Antechinus_mimetes*	1.00	1.00	1.00	1.00	1.00
Mammals	*Antechinus_stuartii*	1.00	1.00	1.00	1.00	1.00
Mammals	*Burramys_parvus*	0.36	1.00	1.00	1.00	1.00
Mammals	*Cercartetus_nanus*	1.00	1.00	1.00	1.00	1.00
Mammals	*Dasyurus_maculatus_maculatus*	1.00	1.00	1.00	1.00	1.00
Mammals	*Isoodon_obesulus_obesulus*	0.98	1.00	1.00	1.00	1.00
Mammals	*Mastacomys_fuscus_mordicus*	0.52	0.96	1.00	1.00	1.00
Mammals	*Notamacropus_parma*	0.76	1.00	1.00	1.00	1.00
Mammals	*Notamacropus_rufogriseus*	1.00	1.00	1.00	1.00	1.00
Mammals	*Ornithorhynchus_anatinus*	1.00	1.00	1.00	1.00	1.00
Mammals	*Perameles_nasuta*	1.00	1.00	1.00	1.00	1.00
Mammals	*Petauroides_volans*	1.00	1.00	1.00	1.00	1.00
Mammals	*Petaurus_australis*	1.00	1.00	1.00	1.00	1.00
Mammals	*Petrogale_penicillata*	0.92	1.00	1.00	1.00	1.00
Mammals	*Phascolarctos_cinereus*	1.00	1.00	1.00	1.00	1.00
Mammals	*Potorous_longipes*	0.80	1.00	1.00	1.00	1.00
Mammals	*Pseudomys_fumeus*	0.60	0.98	1.00	1.00	1.00
Mammals	*Pseudomys_novaehollandiae*	0.64	1.00	1.00	1.00	1.00
Mammals	*Pseudomys_oralis*	0.84	1.00	1.00	1.00	1.00
Mammals	*Pteropus_poliocephalus*	1.00	1.00	1.00	1.00	1.00
Mammals	*Rattus_fuscipes*	1.00	1.00	1.00	1.00	1.00
Mammals	*Rattus_lutreolus*	1.00	1.00	1.00	1.00	1.00
Mammals	*Sminthopsis_fuliginosus_aitkeni*	0.06	0.54	0.71	0.88	0.93
Mammals	*Sminthopsis_leucopus*	0.88	1.00	1.00	1.00	1.00
Mammals	*Tachyglossus_aculeatus_multiaculeatus*	0.26	0.94	1.00	1.00	1.00
Mammals	*Thylogale_thetis*	0.94	1.00	1.00	1.00	1.00
Mammals	*Trichosurus_caninus*	1.00	1.00	1.00	1.00	1.00
Mammals	*Vombatus_ursinus*	1.00	1.00	1.00	1.00	1.00
Mammals	*Wallabia_bicolor*	1.00	1.00	1.00	1.00	1.00
Reptiles	*Amalosia_lesueurii*	0.46	0.96	1.00	1.00	1.00
Reptiles	*Austrelaps_labialis*	0.18	0.51	0.88	0.82	0.94
Reptiles	*Austrelaps_ramsayi*	0.70	1.00	1.00	1.00	1.00
Reptiles	*Calyptotis_ruficauda*	0.12	0.12	0.40	0.57	0.74
Reptiles	*Carinascincus_coventryi*	0.56	0.92	1.00	1.00	1.00
Reptiles	*Coeranoscincus_reticulatus*	0.02	0.10	0.20	0.39	0.24
Reptiles	*Cyclodomorphus_michaeli*	0.42	0.98	1.00	1.00	1.00

Group	Species	0.1	0.3	0.5	0.7	0.9
Reptiles	*Cyclodomorphus_praealtus*	0.04	0.34	0.56	0.78	0.88
Reptiles	*Drysdalia_rhodogaster*	0.28	0.82	1.00	1.00	1.00
Reptiles	*Egernia_mcpheei*	0.28	0.60	0.88	0.98	0.98
Reptiles	*Eulamprus_heatwolei*	0.86	1.00	1.00	1.00	1.00
Reptiles	*Eulamprus_leuraensis*	0.16	0.46	0.67	0.66	0.82
Reptiles	*Eulamprus_tympanum*	0.42	0.92	0.98	1.00	1.00
Reptiles	*Harrisoniascincus_zia*	0.09	0.09	0.06	0.08	0.15
Reptiles	*Hoplocephalus_bungaroides*	0.21	0.23	0.68	0.86	0.83
Reptiles	*Liopholis_guthega*	0.04	0.05	0.08	0.00	0.05
Reptiles	*Lissolepis_coventryi*	0.38	0.82	0.96	1.00	1.00
Reptiles	*Myuchelys_purvisi*	0.11	0.22	0.16	0.33	0.47
Reptiles	*Phyllurus_platurus*	0.28	0.88	0.98	1.00	1.00
Reptiles	*Pseudemoia_cryodroma*	0.10	0.08	0.32	0.24	0.26
Reptiles	*Pseudemoia_rawlinsoni*	0.30	0.92	1.00	1.00	1.00
Reptiles	*Saproscincus_mustelinus*	0.88	1.00	1.00	1.00	1.00
Reptiles	*Saproscincus_rosei*	0.06	0.22	0.50	0.68	0.66
Reptiles	*Saproscincus_spectabilis*	0.12	0.16	0.36	0.43	0.56
Bats	*Chalinolobus_dwyeri*	0.76	1.00	1.00	1.00	1.00
Bats	*Falsistrellus_tasmaniensis*	0.88	1.00	1.00	1.00	1.00
Bats	*Nyctophilus_gouldi*	0.90	1.00	1.00	1.00	1.00
Bats	*Phoniscus_papuensis*	0.62	0.98	1.00	1.00	1.00
Bats	*Rhinolophus_megaphyllus*	0.86	1.00	1.00	1.00	1.00
Bats	*Scoteanax_rueppellii*	0.86	1.00	1.00	1.00	1.00
Bats	*Scotorepens_orion*	0.88	1.00	1.00	1.00	1.00
Bats	*Vespadelus_darlingtoni*	0.90	1.00	1.00	1.00	1.00
Bats	*Vespadelus_pumilus*	0.66	1.00	1.00	1.00	1.00
Bats	*Vespadelus_regulus*	0.86	1.00	1.00	1.00	1.00

Further information:

http://www.nespthreatenedspecies.edu.au

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Threatened Species Recovery Hub

National Environmental Science Programme