Threatened Species Recovery Hub

National Environmental Science Programme

Typical offsets for threatened species

Report prepared for the Department of Agriculture, Water and the Environment

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Cover image: Carnaby's black cockatoos. Image: Leonie Valentine

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Pink-tailed worm-lizard. Image: Damian Michael.

Introduction

Biodiversity offsets are routinely prescribed as conditions of approval for development actions that are likely to result in significant impacts to Matters of National Environmental Significance (MNES) listed under the *Environment Protection and Biodiversity Conservation (EPBC) Act (1999)*. For MNES that are threatened species and ecological communities, offsets have most commonly been prescribed via the legal protection of land (Miller et al., 2015), which aims to provide a measurable benefit in the area and quality of habitat protected. However, it is increasingly understood that legal protection of land may not be feasible, cost effective or beneficial for all threatened species and ecological communities under the EPBC Act.

To develop guidance which may assist in identifying better offsets, we first require an understanding of: a) which threatened species and ecological communities may be challenging to consider during environmental impact assessment under a land based offset model, and b) how decision makers have dealt with these challenges as part of EPBC Act conditions of approval in the past. Here we define a "typical offset" as an activity (or combination thereof) that has historically been required under a condition of approval under Section 134 the EPBC Act, as a means of compensating for significant residual impacts to threatened species and ecological communities that result from taking of the action.

As part of the NESP Threatened Species Recovery Hub's '*Better offsets for threatened species*' project, this research aimed to identify which threatened species and ecological communities commonly trigger offset requirements under the EPBC Act, and the types of offset activities typically applied for them. This analysis was conducted as a necessary precursor to other work within the project which used targeted expert elicitation to derive estimates of the expected benefits and costs of management actions to inform offset conditions, for a subset of the species and communities identified here.

Methodology

Identification of 'focal' MNES and other groups

We identified threatened species and ecological communities listed as Matters of National Environmental Significance under the EPBC Act, that commonly trigger the requirement for offsets (hereafter focal MNES) using the following criteria:

1. there currently is limited data available to inform offset strategies; AND/OR
2. appropriate offsets are challenging to identify and/or highly costly to secure; AND/OR
3. typical approaches to offsets are/may be of limited benefit.

This assessment was conducted in consultation (undertaken between January and August 2016) with the (then) Department of the Environment and Energy, and staff from relevant Australian state and territory government departments.

This process identified thirty-five (35) focal MNES (Table 1), in addition to another six groups of species which met at least one of our criteria (cryptic orchids, marine species, small-bodied woodland birds, Stygofauna and troglofauna species, migratory shorebirds, woodland bird species associated with scattered tree landscapes). The list includes nine ecological communities and 26 species, of which are 14 vulnerable, 10 endangered and 10 critically endangered MNES.

To identify information on typical offset approaches historically applied as conditions of approval under the EPBC Act, we initially consulted the EPBC Referral Notices database (http://epbcnotices.environment.gov.au/referralslist/). We considered referral notices only for approved actions (hereby approval notices) approved under the EPBC Act between 2007 and 2017. Approval notices detail the legal conditions that have attached to a development action as part of an approval decision under the EPBC Act. It is within the approval notice that offset or offset-like activities can be identified, thereby providing information on typical offset approaches applied by decision makers within EPBC Act assessment and approval processes.

Since the EPBC Referral Notices database is not searchable by MNES name (but is indexed by Google search engine), to collate relevant approval notices we used the Google search engine by using search terms such as "*[MNES name] epbc approval decision*". The links discovered by Google generally linked back to the EPBC Referral Notices database. We did not conduct a comprehensive search of approval notices, but instead aimed to gain representative sample of typical offset activities for each of the 35 focal MNES and 6 other groups. We attempted to find at least one approval notice for each focal MNES and included multiple approval notices for each MNES (up to a maximum of 10) where records allowed.

Table 1. *Focal MNES and other groups considered in this analysis, based on stakeholder assessment according to criteria: 1) limited data are available to inform offset strategies; 2) offsets are challenging to identify/highly costly; and/or 3) typical approaches to offsets are/may be of limited benefit. Approval notices were identified for 30 of the 41 focal MNES and other groups.*

ID	Category	EPBC threat status	Name	No. approval notices identified
1	Species	V	Australian grayling	2
2	Species	V	Baudin's cockatoo	6
3	Species	E	Carnaby's black cockatoo	13
4	Species	V	Flinders Ranges worm lizard	-
5	Species	V	Greater bilby	7
6	Species	V	Legless lizard	5
7	Species	V	Malleefowl	9
8	Species	NA	Marsupial mole	3
9	Species	V	Mulgara	4
10	Species	E	Night parrot	3
11	Species	E	Northern quoll	11
12	Species	CE	Orange-bellied parrot	2
13	Species	V	Pilbara leaf-nosed bat	5
14	Species	V	Pilbara olive python	8
15	Species	V	Pink-tailed worm-lizard	-
16	Species	E	Pygmy blue-tongue lizard	1
17	Species	CE	Regent honeyeater	7
18	Species	E	Sandhill dunnart	2
19	Species	CE	Southern bent-wing bats	1
20	Species	CE	Spiny rice flower	4
21	Species	V	Spot-tailed quoll	4
22	Species	E	Tasmanian devil	5
23	Species	V	Thick-billed grasswrens	2
24	Species	V	Wallum sedge frog	3
25	Species	E	Wedge-tailed eagle (Tasmanian)	4
26	Species	V	Western ringtail possum	5
27	Other group	NA	Cryptic orchids - e.g. sunshine diuris	-
28	Other group	NA	Marine species	5
29	Other group	NA	Small-bodied woodland birds	-
30	Other group	NA	Stygofauna and troglofauna species	-
31	Other group	NA	Woodland bird species associated with scattered tree landscapes	-
32	Migratory Species	NA	Migratory shorebirds	11
33	Ecological Community	E	Banksia Woodlands of the Swan Coastal Plain	-
34	Ecological Community	E	Brigalow (*Acacia harpophylla* dominant and co-dominant)	6
35	Ecological Community	CE	Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest	-
36	Ecological Community	CE	Eucalyptus Odorata Grassy Woodlands	1
37	Ecological Community	E	Eucalyptus petiolaris Woodland on Eyre Peninsula	-
38	Ecological Community	CE	Fleurieu Swamps	-
39	Ecological Community	CE	Grassy Eucalypt Woodlands of the Victorian Volcanic Plains	1
40	Ecological Community	CE	Irongrass Grasslands	2
41	Ecological Community	CE	Littoral Rainforest and Coastal Vine Thickets of Eastern Australia	-

We successfully identified approval notices for a total of 80 controlled actions (where there were significant residual impacts to MNES, and offsets may form conditions of approval) relating to 30 focal MNES and other groups. We were unable to locate approval notices for two threatened species, five ecological communities and four other groups (Table 1). Approval notice PDFs were converted into PDFs with selectable text using the batch process in Adobe Acrobat DC.

Data extraction

Data was collated from each approval notice as per the data structure shown in Table 2. For each approved action, basic information was extracted (Table 2, rows 1 to 10) including the decision date, EPBC referral number, approval expiry date and duration, which jurisdiction the action occurs in. Approved actions were also categorized (as per Macintosh and Waugh (2014)) according to the type of development it related to (e.g transport, energy generation and supply, mining, urban development). We also recorded whether the action would have been approved prior to, or after the introduction of the Environmental Offsets Policy (2012).

We recorded the MNES on our focal list (Table 1) impacted by each approved action, and the unit and amount of impact (if described). Approval notices usually reported one impact (e.g in area of habitat cleared) per MNES, but occasionally multiple types of impacts (e.g area of habitat in addition to number of nesting hollows) were recorded per MNES per approved action.

To identify where offsets had been prescribed as part of a condition of approval, the approval notice was searched for the terms "offset", "compensation" and "protect*".If none of these terms were found, we identified offsets based on a judgement of whether a condition appeared to be intended as a compensatory measure (even if not explicitly stated as such, or necessarily meeting current standards of what constitutes an offset). An offset (package) may involve multiple management activities, for example, legal protection of land combined with pest control. We recorded each of these management activities as separate "offset activities", which in combination make up an offset for the approved action. We differentiated between the on-ground activity being specified by the condition, and the mechanism of delivery for that activity. For example, for a condition that reads "*the person taking the action must prepare a management plan….*", the offset delivery mechanism is "Management Plan". It was not uncommon for the offset action to not be explicitly detailed, and in these cases the offset activity was listed as "Unspecified". This is illustrated in the example above, where the generic requirement for a "*the person taking the action must prepare a management plan*", leaves the required activity unspecified.

Where details were provided in the condition text about what kinds of management the plan must include, 'offset activity' could be explicitly identified. In these cases, we listed each of the specified activities associated with the offset as a separate offset activity, and identified the threat the stated action was intended to address. For example, "legal protection of habitat"(the action) was aligned with habitat loss (the threat); pest control with pest management, etc. The database is in a disaggregated format – i.e one line per offset activity. There can be multiple offset activities per approval notice and MNES. We categorized offset activities according to May et al. (2017), but modified substantially to differentiate on-ground actions from delivery mechanisms.

Table 2. Structure of the database compiled during this analysis

ID	Datapoint	Description
Approved action		
1	Decision Date	Date the approval was granted by the delegated authority
2	EPBC referral	Unique identifier (e.g 2014/7205)
3	Approval expiry	Date of expiry of the EPBC approval
4	Approval length (years)	Duration between approval date and expiry date
5	Delegated authority	Minister or senior executive name
6	Person to whom the approval is granted	Proponent name
7	Project Name	
8	Category	As per Macintosh and Waugh (2014)
9	Jurisdiction	State or territory
10	Pre or post 2012 policy	Whether the action was approved before or after the introduction of the EPBC Act Environmental Offsets Policy (2012)
MNES		
11	Name (detailed)	Full name of MNES
12	Name (simple)	Simplified to account for groupings, e,g marine species, legless lizards
13	Species or community	
14	Threat status	Vulnerable, endangered, critically endangered, or N/A (migratory species or not listed on EPBC Act)
15	Threat status (simple)	Simplified to account for groupings, e,g marine species, legless lizards
Impact		
16	Unit of Impact	Hectares, km^2, no. individuals, no. features, unspecified
17	Amount affected	If available
Offset		
18	Offset activity number	The full offset package for an MNES-impact combination may consist of multiple activities (e.g secure land, herbivore control, predator control)
19	"Offset" mentioned?	Yes or no
20	Offset name	If available
21	Offset Value	If available; In dollars
22	Offset Measurement	If available; Hectares, dollars, dollars per individual killed, dollars per year, dollars per ha, km^2, no. features, habitat points, ratio
23	Offset Size/Amount	If available
24	Condition number	As per approval notice
25	Offset activity	Adapted from May et al.(2017)
	Other group	NA
26	Primary or secondary	Whether the offset action is the main or a supporting action in the offset package
27	Offset delivery mechanism	Existing conservation estate, land to be secured (by proponent or third party), transfer to conservation estate, management plan, monetary contribution (to government or third party), trust fund establishment
28	Other specified parties	Third parties explicitly identified as being partly or wholly responsible for the offset delivery
29	Offset details	Full condition text from the approval notice
30	Management plan accompanying action?	Yes or no
31	Management plan name	If specified
32	Legal protection mechanism	If specified

Results

Approved actions

The majority of approved actions in our sample were from Western Australia (46%, n= 37), which likely dominated our sample due to a large number of the focal MNES being primarily located in this jurisdiction (e.g Greater bilby, Carnaby's and Baudin's black cockatoos, Pilbara olive python, Northern quoll). Of the 80 actions examined, 71% (n=57) were approved after the introduction of the EPBC Act Environmental Offsets Policy in October 2012 (Figure 1).
The majority of actions we analysed were from Western Australia (46%, n= 37

Mining activities (54%) were most frequently represented in the sample, followed by transport developments (20 actions in total, 15%). Approval duration (time between decision date and approval expiry) ranged from a minimum of five years (e.g 2008/3948, Victorian Desalination Project (VDP), Bass Coast, Victoria) to 100 years (2009/4748, Infrastructure Upgrade and Construction at Canberra Airport; Figure 2).

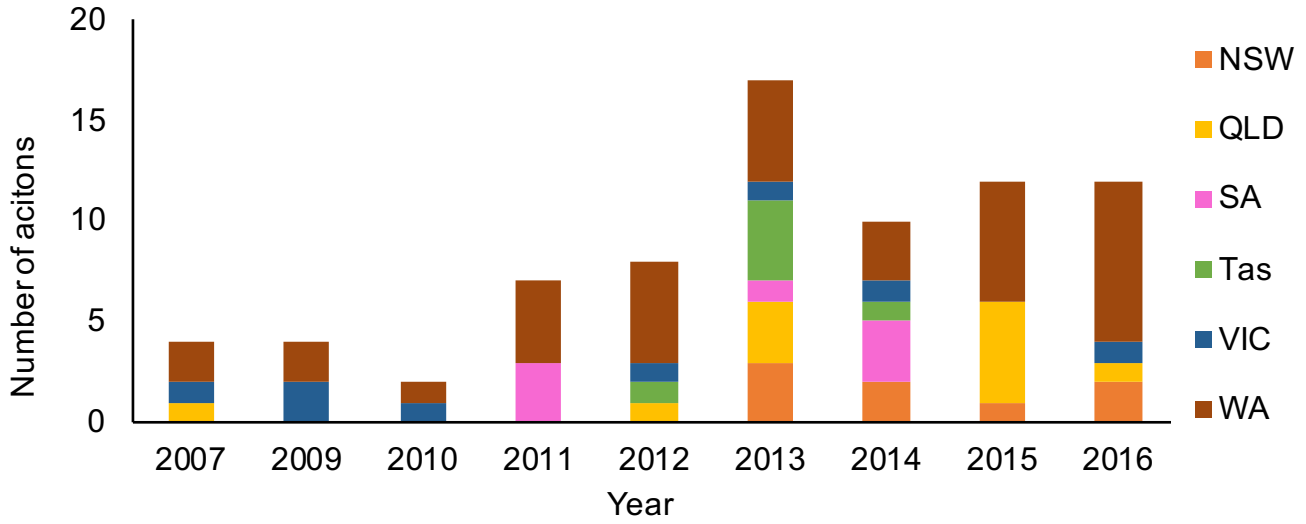

Figure 1. *Approved actions over time by jurisdiction.*

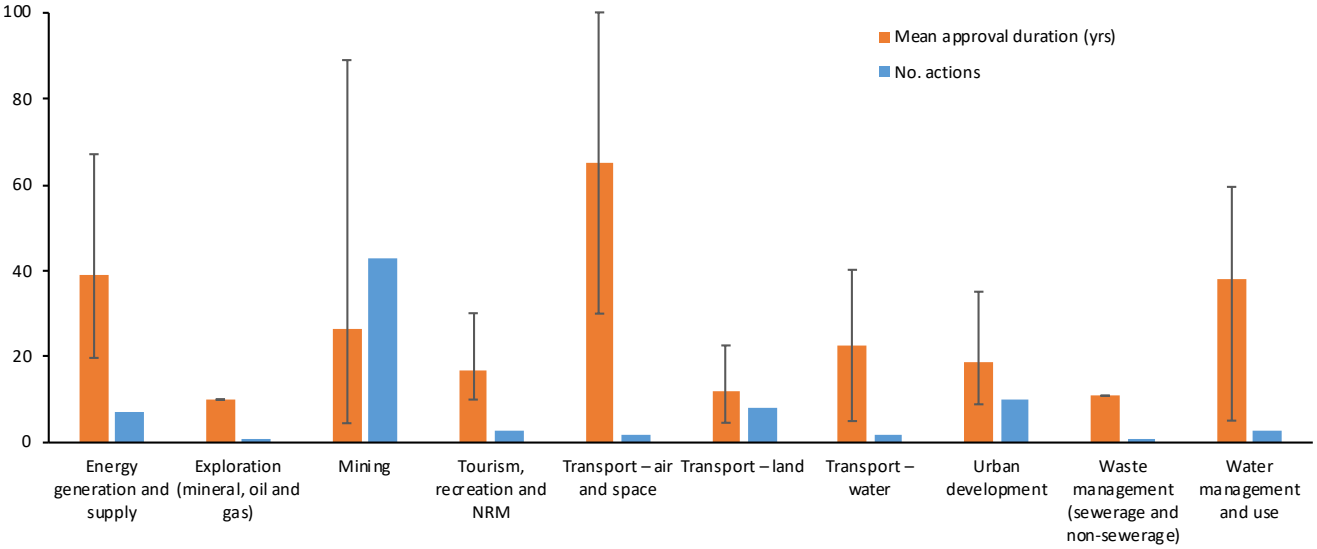

Figure 2. *Mean the approval duration (years) for actions within each category. Error bars indicate the range of values.*

Impacts

A total of 147 individual impacts were identified across 80 approved actions for 30 MNES or other groups. 51% of the impacts specified in approval notices were in units of hectares, and a small number were number of features (n=2, for example feeding trees for Carnaby's black cockatoo) and number of individuals (n=6, for spiny rice flower, Tasmanian devil, spotted quoll, and Tasmanian wedge-tailed eagle). The remaining 44% of impacts were unspecified. The proportion of unspecified impacts was higher for actions approved prior to the release of EPBC Act Environmental Offsets Policy in October 2012 (74%, versus 35% post-2012).

Offset activities and delivery mechanisms

A total of 280 individual offset activities were identified across 80 approved actions for 30 MNES or other groups. Each approved action included an average of 3.5 (±2.2) offset activities, with a maximum of 13 (for referral 2010/5696, expansion of the Cloudbreak iron ore mine).

46% of conditioned offset activities were quantified by area (hectares or km2), and 18% were specified in dollars (or dollars per ha, per year or per individual killed). A third of all offset activities examined (33%) were unspecified i n the amount required to compensate for impacts.

Legal protection of habitat was by far the most commonly conditioned offset activity (Figure 3, 20%, n=55). Out of all conditioned offset activities, 13% were not specified. In these cases, the condition text generally referred to development of an offset management plan, the establishment of a trust fund or a monetary contribution as the offset delivery mechanism, but with no specifics about the type of management activities required to compensate for impacts to MNES.

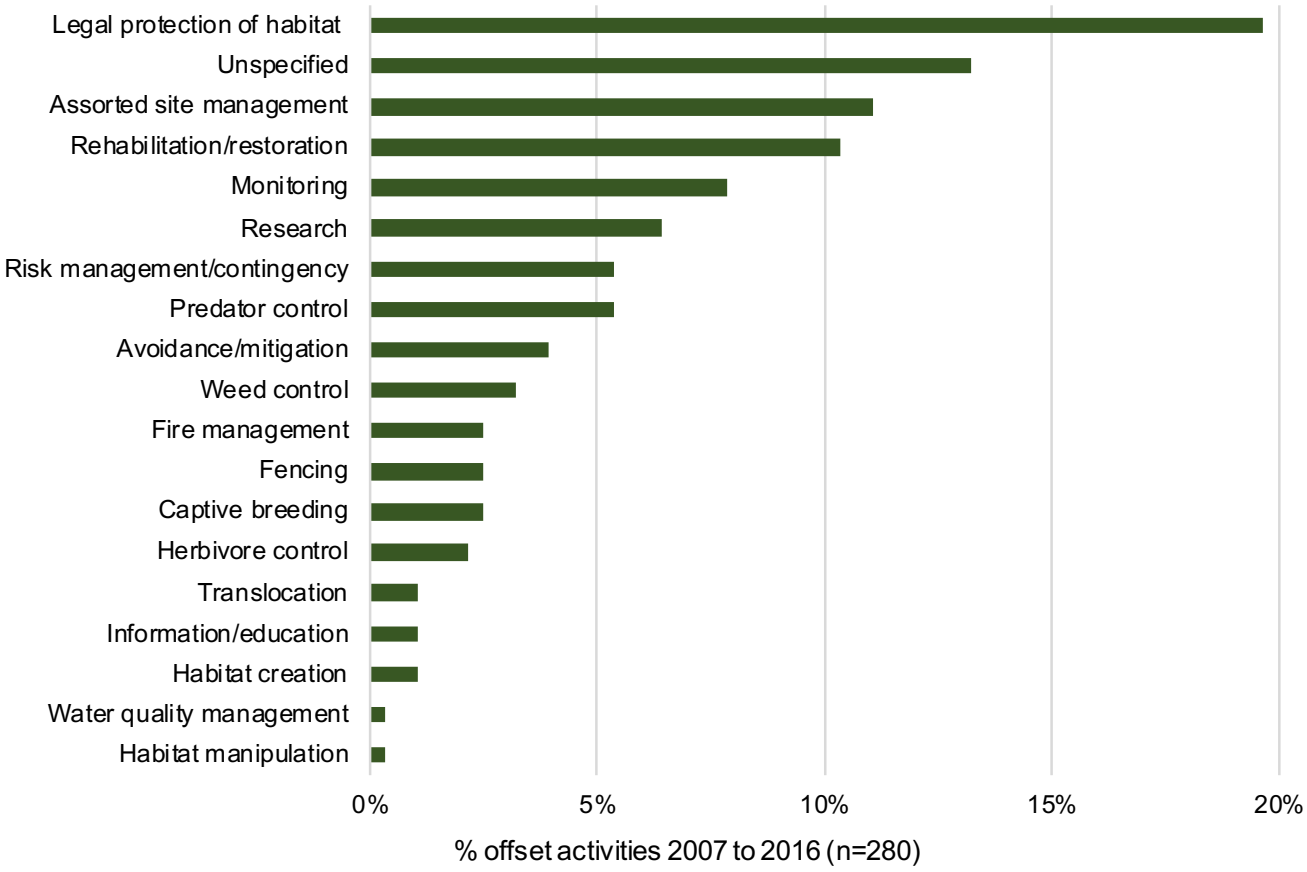

Figure 3. *Offset activities conditioned across all approved actions.*

Assorted site management (11%) was conditioned as part of offset management plans which specified a range of activities "...including but not limited to management of livestock, weed control, erosion and sediment control, fire management, and restrictions on access". Research was conditioned as an offset activity in 6.5% of cases, generally via the establishment of a trust fund or a monetary contribution. Such conditions were frequently associated with impacts to MNES in the Pilbara region.

Monitoring was explicitly referred to in condition text less frequently after the release of the EPBC Act Environmental Offsets Policy in 2012 (Figure 4). Avoidance/mitigation actions alone appeared to be conditioned more frequently prior to 2012 (11%) than after 2012 (2%).

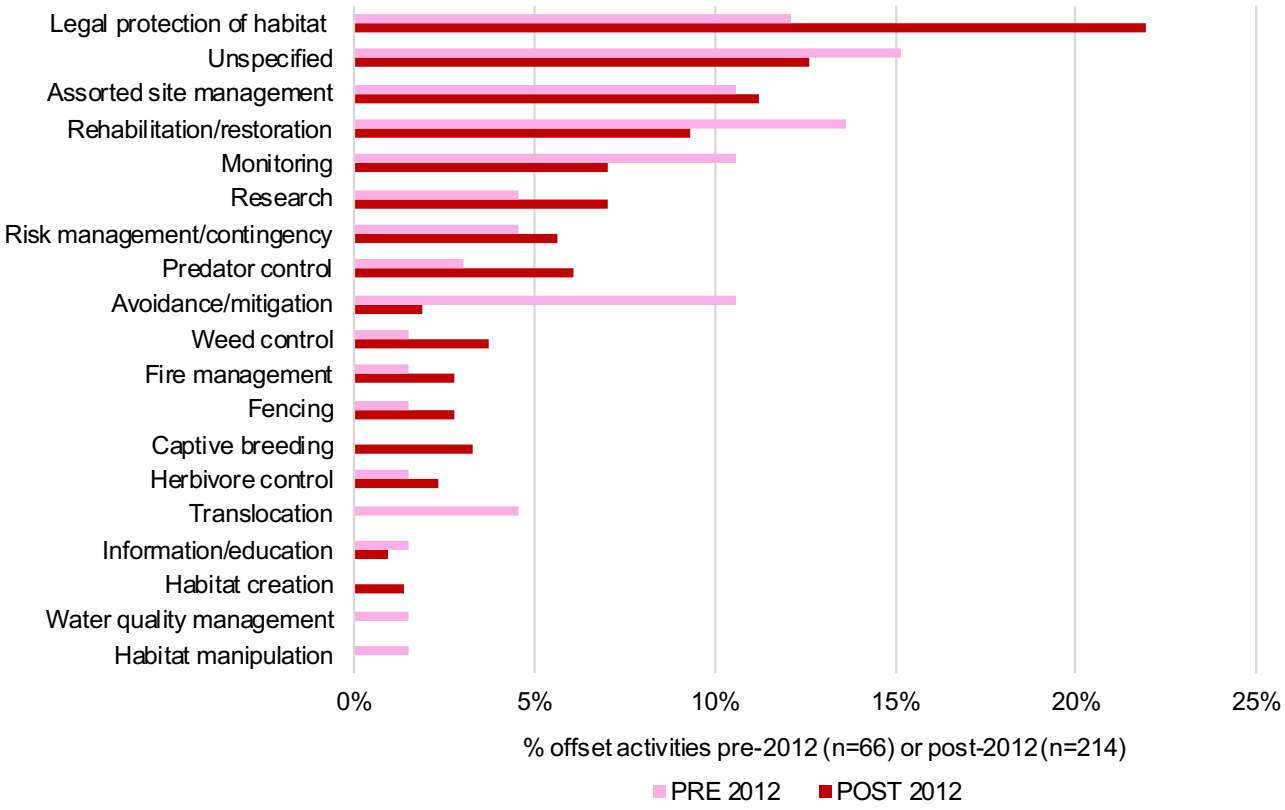

Figure 4. Offset activities conditioned across all approved actions, split according to whether it was conditioned prior to or after the introduction of the EPBC Act Environmental Offsets Policy in 2012.

Management plans were most frequently specified mechanism for delivery of offset activities (51%, Figure 4). Legally securing land by the proponent, a third party, or by transfer to conservation estate collectively accounted for 19% of conditioned offsets, and 18% required monetary contributions (either to government, a third party, or an unspecified party). There were 5 instances of offsets being conditioned within existing conservation estate (all conditioned prior to 2012).

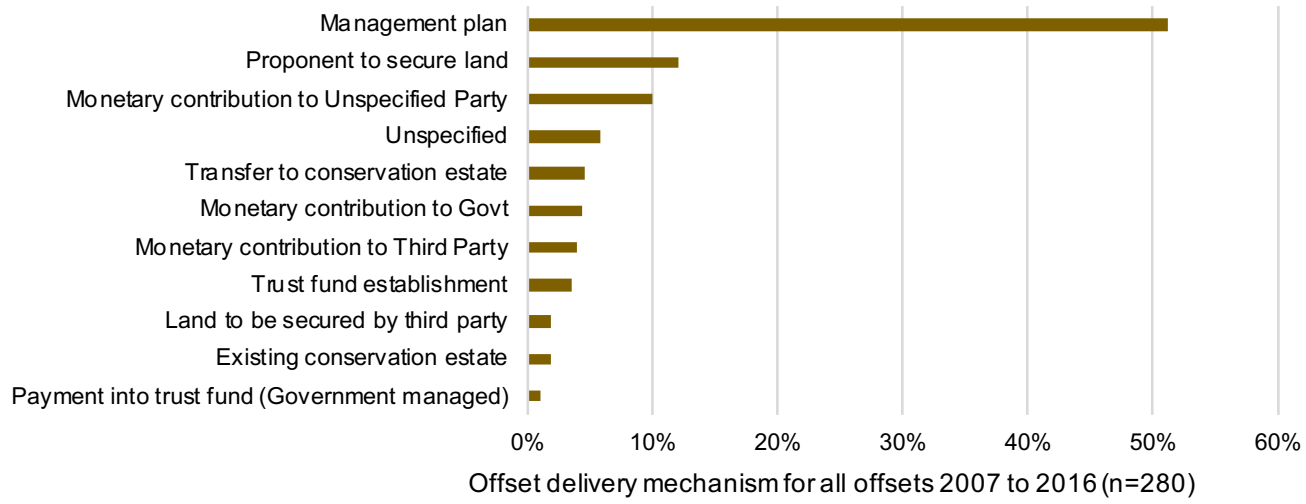

Figure 5. Offset delivery mechanism specified in condition text for all offset activities.

Legal protection of habitat was the most frequently conditioned offset activity for individual MNES (Figure 6), with a few notable exceptions. Monitoring was conditioned in lieu of any other offset activities for the Wedge-tailed eagle (Tasmanian) in all approved projects impacting this MNES (n=4). Conditions for the Tasmanian devil most frequently specified a payment to the Save the Devil Fund, "explicitly for the purpose of maintenance of the Tasmanian Devil insurance population" (classified as captive breeding). Offset activities were mostly unspecified for the Northern quoll, Pilbara leaf-nosed bat and the Pilbara olive python, as conditions for approved actions involving these MNES generally required the establishment of a trust fund by the proponent, but the use of these monies was not specified in the approval notice.

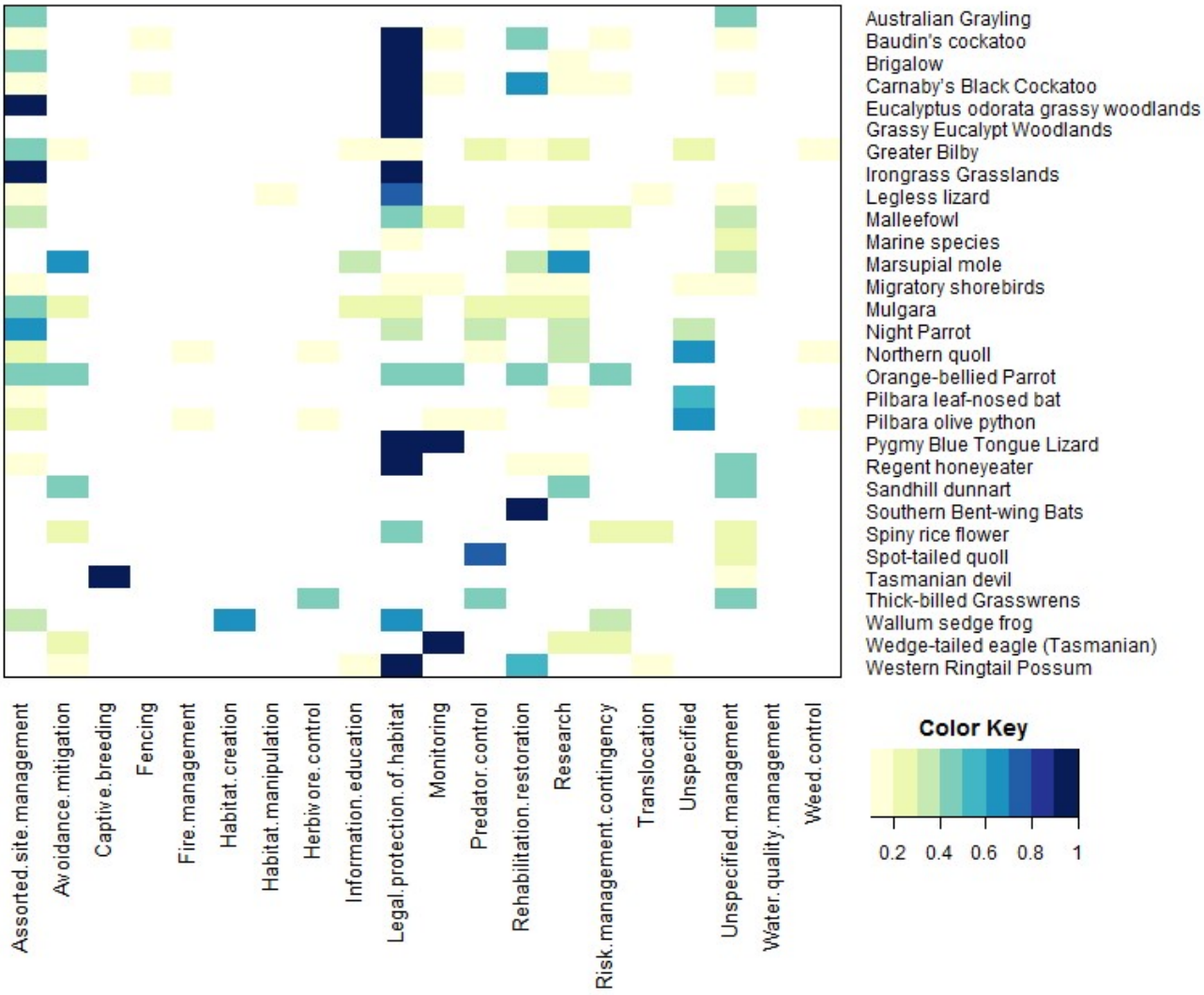

Figure 6. *Heat map diagram indicating the proportion of offset activities for each MNES.*

Orange-bellied parrot. Image: JJ Harrison, Wikimedia Commons, CC BY SA 3.0

Discussion

This research aimed to identify which threatened species and ecological communities commonly trigger offset requirements under the EPBC Act, and the types of offset activities typically applied for them. Through a consultative process conducted with the (then) Department of the Environment and Energy, and staff from relevant Australian state and territory government departments, we identified thirty-five (35) focal matters of national environmental significance (MNES) and six other groups for which:

1. there currently is limited data available to inform offset strategies; AND/OR
2. appropriate offsets are challenging to identify and/or highly costly to secure; AND/OR
3. typical approaches to offsets are/may be of limited benefit.

We collated information on typical offset approaches historically applied as conditions of approval for these focal MNES and other groups by consulting EPBC approval notices for actions approved under the EPBC Act. We identified 80 actions approved between 2007 and 2016 where significant residual impacts had been approved with conditions for 30 of our focal MNES and other groups. Based on our analysis of the impacts and conditions within approval notices, there were three key findings.

First, despite identifying a selection of focal MNES and other groups whereby legal protection of land may not be feasible, cost effective or beneficial, we did still find that legal protection of habitat was the most frequently conditioned offset activity across our full sample. This is partly due to the nature of our sample – we had an uneven number of approval notices for each focal MNES, and many of the conditions related to impacts to species such as the Regent honeyeater and Carnaby's Black Cockatoo. This may itself be reflective of a legacy effect – that is, it is now more widely understood, in part due to the introduction of the Environmental Offsets Policy in 2012, that protecting an existing parcel of habitat is not usually sufficient to compensate for an impact, except in rare circumstances where there is a high avoided loss (Maseyk et al., 2020). More broadly, we cannot ascertain the efficacy of the offsets required as part of conditions of approval without conducting an ex-post evaluation of each impact and offset.

Second, there were many instances where the amount or unit of impacts to MNES were unspecified in the approval notice. Similarly, a third of all offset activities examined were unspecified in the amount required to compensate for impacts. Although it appears that the amount of detail on impacts provided in approval notices is (generally) improving over time, it is difficult to judge the adequacy of measures used to offset residual impacts to MNES unless we know the amount and type of impacts, and the amount and type of offsets being required. It is possible that further detail is provided in management plans attached to environmental conditions for approved actions, but it was beyond the scope of this study to track down these additional documents on proponent websites.

Third, there appeared to be some conflation between the mechanism by which an offset is delivered (e.g a plan, a fund), and the on-ground management activity that leads to measurable benefits for the MNES. For example, condition text often contained a generic requirement that "*the person taking the action must prepare a management plan*", leaves the required activity unspecified. Alternatively, the condition text specified a monetary amount for an offset. As discussed above, the detail of the on-ground activity may be provided in separate document, but this lack of specificity suggests (a) there is a lack of knowledge of how to deliver a measurable benefit for the MNES, and (b) uncertainty in how, and if, the approved impact will be adequately compensated for.

There are some important limitations to our work. Our sample of MNES and other groups was developed in collaboration with practitioners and so is necessarily purposive. This means that it is difficult and potentially misleading to draw trends on typical offset activities from across our sample. Instead, the value of identifying typical offsets is likely more at the case level (e.g a single MNES or collection of MNES with similar attributes) so as to inform an expert elicitation process where the benefits of a broad range of activities are quantified. Nevertheless, this work does provide a useful starting point for future under the 'Better offsets for threatened species' project, and has highlighted issues around the level of detail provided in EPBC conditions of approval as well as a need to better distinguish between the mechanism of offset delivery, and the actual on-ground activity associated with an offset.

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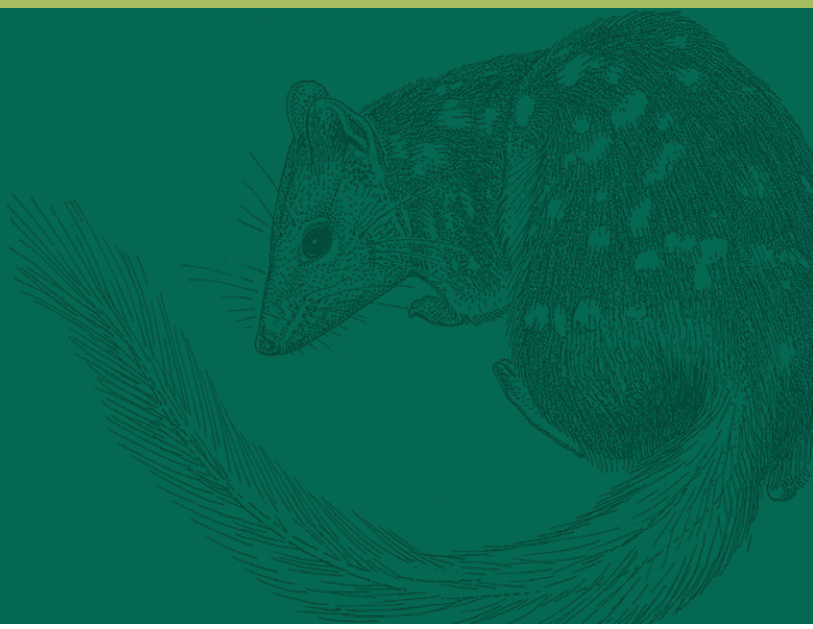
Northern quoll. Image: Nicolas Rakotopare

Further information:
http://www.nespthreatenedspecies.edu.au



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