



Biodiversity Offset Strategy

Carmichael Coal Mine and Rail Project

Adani Mining Pty Ltd

Rev	Date	Description	Checked	Approved
0	29/10/14	Final	29/10/14	29/10/14
1	26/05/15	Revised final based on feedback from regulators	26/05/15	26/05/15
2	16/06/15	Revised final based on feedback from Adani	16/06/15	16/06/15
3	23/08/16	Revised final based on feedback from the Department of the Environment and Energy, and Department of Environment and Heritage Protection	22/08/16/	23/08/16

	Name	Position
Originators	s47F	Senior Consultant
	s47F	Senior Consultant
Approver	s47F	Senior Manager

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Offsets Assessment Guide

For use in determining offsets under the *Environment Protection and Biodiversity Conservation Act 1999*
2 October 2012
This guide relies on Macros being enabled in your browser.

Matter of National Environmental Significance	
Name	ornamental snake
EPBC Act status	Vulnerable
Annual probability of extinction <small>Based on IUCN category definitions</small>	0.2%

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator						
Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
<i>Ecological communities</i>						
Area of community	No		Area			
			Quality			
			Total quantum of impact	0.00		
<i>Threatened species habitat</i>						
Area of habitat	Yes	Ornamental Snake Habitat	Area	49	Hectares	Carmichael Coal Mine Ecological Equivalence Assessment (ELA 2014) Impacts for Stage 1 calculated by CO2 Australia Limited
			Quality	5	Scale 0-10	
			Total quantum of impact	24.50	Adjusted hectares	
<i>Threatened species</i>						
Birth rate e.g. Change in nest success	No					
Mortality rate e.g. Change in number of road kills per year	No					
Number of individuals e.g. Individual plants/animals	No					

Offset calculator																													
Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start area and quality	Future area and quality without offset	Future area and quality with offset	Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source													
<i>Ecological Communities</i>																													
Area of community	No				Risk-related time horizon (max. 20 years)	Start area (hectares)	Risk of loss (%) without offset	Risk of loss (%) with offset																					
					Future area without offset (adjusted hectares)	0.0	Future area with offset (adjusted hectares)	0.0																					
					Time until ecological benefit	Start quality (scale of 0-10)	Future quality without offset (scale of 0-10)	Future quality with offset (scale of 0-10)																					
<i>Threatened species habitat</i>																													
Area of habitat	Yes	24.50	Adjusted hectares	Stage 1 Offset Areas Moray Downs West	Time over which loss is averted (max. 20 years)	20	Start area (hectares)	135	Risk of loss (%) without offset	40%	Risk of loss (%) with offset	20%	Raw gain	27.00	Confidence in result (%)	80%	Adjusted gain	21.60	Net present value	20.75	% of impact offset	25.28	Minimum (90%) direct offset requirement met?	Yes	Cost (\$ total)		Information source		
					Future area without offset (adjusted hectares)	81.0	Future area with offset (adjusted hectares)	108.0																					
					Time until ecological benefit	5	Start quality (scale of 0-10)	5	Future quality without offset (scale of 0-10)	4	Future quality with offset (scale of 0-10)	6	Raw gain	2.00	Confidence in result (%)	80%	Adjusted gain	1.60	Net present value	1.58									
<i>Threatened species</i>																													
Birth rate e.g. Change in nest success	No																												
Mortality rate e.g. Change in number of road kills per year	No																												
Number of individuals e.g. Individual plants/animals	No																												

Summary							
Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost (\$)		
					Direct offset (\$)	Other compensatory measures (\$)	Total (\$)
Birth rate	0				\$0.00		\$0.00
Mortality rate	0				\$0.00		\$0.00
Number of individuals	0				\$0.00		\$0.00
Number of features	0				\$0.00		\$0.00
Condition of habitat	0				\$0.00		\$0.00
Area of habitat	24.5	25.28	103.20%	Yes	\$0.00	N/A	\$0.00
Area of community	0				\$0.00		\$0.00
					\$0.00	\$0.00	\$0.00

Offsets Assessment Guide

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Matter of National Environmental Significance	
Name	ornamental snake
EPBC Act status	Vulnerable
Annual probability of extinction Based on IUCN category definitions	0.2%

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator					
Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact	Units	Information source
<i>Ecological communities</i>					
Area of community	No		Area		
			Quality		
			Total quantum of impact	0.00	
<i>Threatened species habitat</i>					
Area of habitat	Yes	Ornamental Snake Habitat	Area	49	Hectares
			Quality	5	Scale 0-10
			Total quantum of impact	24.50	Adjusted hectares
Carmichael Coal Mine Ecological Equivalence Assessment (ELA 2014) Impacts for Stage 1 calculated by CO2 Australia Limited					
Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact	Units	Information source
Number of features e.g. Nest hollows, habitat trees	No				
Condition of habitat Change in habitat condition, but no change in extent	No				
<i>Threatened species</i>					
Birth rate e.g. Change in nest success	No				
Mortality rate e.g. Change in number of road kills per year	No				
Number of individuals e.g. Individual plants/animals	No				

Offset calculator																													
Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start area and quality	Future area and quality without offset	Future area and quality with offset	Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source													
<i>Ecological Communities</i>																													
Area of community	No				Risk-related time horizon (max. 20 years)	Start area (hectares)	Risk of loss (%) without offset	Risk of loss (%) with offset																					
					Future area without offset (adjusted hectares)	0.0	Future area with offset (adjusted hectares)	0.0																					
					Time until ecological benefit	Start quality (scale of 0-10)	Future quality without offset (scale of 0-10)	Future quality with offset (scale of 0-10)																					
<i>Threatened species habitat</i>																													
Area of habitat	Yes	24.50	Adjusted hectares	Stage 1 Offset Areas Moray Downs West	Time over which loss is averted (max. 20 years)	20	Start area (hectares)	1310.02	Risk of loss (%) without offset	40%	Risk of loss (%) with offset	20%	Raw gain	262.00	Confidence in result (%)	80%	Adjusted gain	209.60	Net present value	201.39	% of impact offset	245.35	Minimum (90%) direct offset requirement met?	Yes	Cost (\$ total)		Information source		
					Future area without offset (adjusted hectares)	786.0	Future area with offset (adjusted hectares)	1048.0																					
					Time until ecological benefit	5	Start quality (scale of 0-10)	5	Future quality without offset (scale of 0-10)	4	Future quality with offset (scale of 0-10)	6	Raw gain	2.00	Confidence in result (%)	80%	Adjusted gain	1.60	Net present value	1.58									
<i>Threatened species</i>																													
Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start value	Future value without offset	Future value with offset	Raw gain	Confidence in result (%)	Adjusted gain	Net present value	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source													
Number of features e.g. Nest hollows, habitat trees	No																												
Condition of habitat Change in habitat condition, but no change in extent	No																												
Birth rate e.g. Change in nest success	No																												
Mortality rate e.g. Change in number of road kills per year	No																												
Number of individuals e.g. Individual plants/animals	No																												

Summary							
Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost (\$)		
					Direct offset (\$)	Other compensatory measures (\$)	Total (\$)
Birth rate	0				\$0.00		\$0.00
Mortality rate	0				\$0.00		\$0.00
Number of individuals	0				\$0.00		\$0.00
Number of features	0				\$0.00		\$0.00
Condition of habitat	0				\$0.00		\$0.00
Area of habitat	24.5	245.35	1001.42%	Yes	\$0.00	N/A	\$0.00
Area of community	0				\$0.00		\$0.00
					\$0.00	\$0.00	\$0.00

Offsets Assessment Guide

For use in determining offsets under the *Environment Protection and Biodiversity Conservation Act 1999*
2 October 2012
This guide relies on Macros being enabled in your browser.

Matter of National Environmental Significance	
Name	squatter pigeon (southern)
EPBC Act status	Vulnerable
Annual probability of extinction Based on IUCN category definitions	0.2%

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator						
Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
<i>Ecological communities</i>						
Area of community	No		Area			
			Quality			
			Total quantum of impact	0.00		
<i>Threatened species habitat</i>						
Area of habitat	Yes	Squatter Pigeon Habitat	Area	762	Hectares	Carmichael Coal Mine Ecological Equivalence Assessment (ELA 2014) Impacts for Stage 1 calculated by CO2 Australia Limited
			Quality	7	Scale 0-10	
			Total quantum of impact	533.40	Adjusted hectares	
Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
Number of features e.g. Nest hollows, habitat trees	No					
Condition of habitat Change in habitat condition, but no change in extent	No					
<i>Threatened species</i>						
Birth rate e.g. Change in nest success	No					
Mortality rate e.g. Change in number of road kills per year	No					
Number of individuals e.g. Individual plants/animals	No					

Offset calculator																				
Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start area and quality		Future area and quality without offset		Future area and quality with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source	
<i>Ecological Communities</i>																				
Area of community	No				Risk-related time horizon (max. 20 years)	Start area (hectares)	Risk of loss (%) without offset		Risk of loss (%) with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source		
							Future area without offset (adjusted hectares)	0.0	Future area with offset (adjusted hectares)	0.0										
							Time until ecological benefit		Start quality (scale of 0-10)	Future quality without offset (scale of 0-10)									Future quality with offset (scale of 0-10)	
<i>Threatened species habitat</i>																				
Area of habitat	Yes	533.40	Adjusted hectares	Moray Downs West Stage 1 Offset Area	Time over which loss is averted (max. 20 years)	20	Start area (hectares)	2500	Risk of loss (%) without offset	40%	Risk of loss (%) with offset	20%	Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source
									Future area without offset (adjusted hectares)	1500.0	Future area with offset (adjusted hectares)	2000.0								
									Time until ecological benefit	5	Start quality (scale of 0-10)	7								
Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start value		Future value without offset		Future value with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source	
Number of features e.g. Nest hollows, habitat trees	No																			
Condition of habitat Change in habitat condition, but no change in extent	No																			
<i>Threatened species</i>																				
Birth rate e.g. Change in nest success	No																			
Mortality rate e.g. Change in number of road kills per year	No																			
Number of individuals e.g. Individual plants/animals	No																			

Summary							
Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost (\$)		
					Direct offset (\$)	Other compensatory measures (\$)	Total (\$)
Birth rate	0				\$0.00		\$0.00
Mortality rate	0				\$0.00		\$0.00
Number of individuals	0				\$0.00		\$0.00
Number of features	0				\$0.00		\$0.00
Condition of habitat	0				\$0.00		\$0.00
Area of habitat	533.4	545.08	102.19%	Yes	\$0.00	N/A	\$0.00
Area of community	0				\$0.00		\$0.00
					\$0.00	\$0.00	\$0.00

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2 October 2012

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Matter of National Environmental Significance	
Name	squatter pigeon (southern)
EPBC Act status	Vulnerable
Annual probability of extinction Based on IUCN category definitions	0.2%

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator						
Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
<i>Ecological communities</i>						
Area of community	No		Area			
			Quality			
			Total quantum of impact	0.00		
<i>Threatened species habitat</i>						
Area of habitat	Yes	Squatter Pigeon Habitat	Area	762	Hectares	Carmichael Coal Mine Ecological Equivalence Assessment (ELA 2014) Impacts for Stage 1 calculated by CO2 Australia Limited
			Quality	7	Scale 0-10	
			Total quantum of impact	533.40	Adjusted hectares	
<i>Threatened species</i>						
Birth rate e.g. Change in nest success	No					
Mortality rate e.g. Change in number of road kills per year	No					
Number of individuals e.g. Individual plants/animals	No					

Offset calculator																														
Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start area and quality	Future area and quality without offset	Future area and quality with offset	Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source														
<i>Ecological Communities</i>																														
Area of community	No				Risk-related time horizon (max. 20 years)	Start area (hectares)	Risk of loss (%) without offset	Risk of loss (%) with offset																						
					Future area without offset (adjusted hectares)	0.0	Future area with offset (adjusted hectares)	0.0																						
					Time until ecological benefit	Start quality (scale of 0-10)	Future quality without offset (scale of 0-10)	Future quality with offset (scale of 0-10)																						
<i>Threatened species habitat</i>																														
Area of habitat	Yes	533.40	Adjusted hectares	Moray Downs West Stage 1 Offset Area	Time over which loss is averted (max. 20 years)	20	Start area (hectares)	26253.6	Risk of loss (%) without offset	40%	Risk of loss (%) with offset	20%	Raw gain	5250.72	Confidence in result (%)	80%	Adjusted gain	4200.58	Net present value	4036.03	% of impact offset	5724.12	1073.14%	Minimum (90%) direct offset requirement met?	Yes	Cost (\$ total)		Information source		
					Future area without offset (adjusted hectares)	15752.2	Future area with offset (adjusted hectares)	21002.9																						
					Time until ecological benefit	5	Start quality (scale of 0-10)	7	Future quality without offset (scale of 0-10)	6	Future quality with offset (scale of 0-10)	8	Raw gain	2.00	Confidence in result (%)	80%	Adjusted gain	1.60	Net present value	1.58										
<i>Threatened species</i>																														
Birth rate e.g. Change in nest success	No																													
Mortality rate e.g. Change in number of road kills per year	No																													
Number of individuals e.g. Individual plants/animals	No																													

Summary							
Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost (\$)		
					Direct offset (\$)	Other compensatory measures (\$)	Total (\$)
Birth rate	0				\$0.00		\$0.00
Mortality rate	0				\$0.00		\$0.00
Number of individuals	0				\$0.00		\$0.00
Number of features	0				\$0.00		\$0.00
Condition of habitat	0				\$0.00		\$0.00
Area of habitat	533.4	5724.12	1073.14%	Yes	\$0.00	N/A	\$0.00
Area of community	0				\$0.00		\$0.00
					\$0.00	\$0.00	\$0.00

Offsets Assessment Guide

For use in determining offsets under the *Environment Protection and Biodiversity Conservation Act 1999*
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Matter of National Environmental Significance	
Name	Waxy Cabbage Palm
EPBC Act status	Vulnerable
Annual probability of extinction <small>Based on IUCN category definitions</small>	0.2%

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator						
Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
<i>Ecological communities</i>						
Area of community	No		Area			
			Quality			
			Total quantum of impact	0.00		
<i>Threatened species habitat</i>						
Area of habitat	Yes	Waxy Cabbage Palm Habitat	Area	27.1	Hectares	Carmichael Coal Mine Ecological Equivalence Assessment (ELA 2014) Impacts for Stage 1 calculated by CO2 Australia Limited
			Quality	7	Scale 0-10	
			Total quantum of impact	18.97	Adjusted hectares	
<i>Threatened species</i>						
Number of features e.g. Nest hollows, habitat trees	No					
Condition of habitat Change in habitat condition, but no change in extent	No					
Birth rate e.g. Change in nest success	No					
Mortality rate e.g. Change in number of road kills per year	No					
Number of individuals e.g. Individual plants/animals	No					

Offset calculator																									
Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start area and quality	Future area and quality without offset	Future area and quality with offset	Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source									
<i>Ecological Communities</i>																									
Area of community	No				Risk-related time horizon (max. 20 years)	Start area (hectares)	Risk of loss (%) without offset	Risk of loss (%) with offset																	
					Future area without offset (adjusted hectares)	0.0	Future area with offset (adjusted hectares)	0.0																	
					Time until ecological benefit	Start quality (scale of 0-10)	Future quality without offset (scale of 0-10)	Future quality with offset (scale of 0-10)																	
<i>Threatened species habitat</i>																									
Area of habitat	Yes	18.97	Adjusted hectares	Moray Downs West Stage 1 Offset Area	Time over which loss is averted (max. 20 years)	20	Start area (hectares)	90	Risk of loss (%) without offset	40%	Risk of loss (%) with offset	20%	Raw gain	18.00	Confidence in result (%)	80%	Adjusted gain	14.40	Net present value	13.84	19.62	103.44%	Yes		
					Future area without offset (adjusted hectares)	54.0	Future area with offset (adjusted hectares)	72.0																	
					Time until ecological benefit	5	Start quality (scale of 0-10)	7	Future quality without offset (scale of 0-10)	6	Future quality with offset (scale of 0-10)	8	Raw gain	2.00	Confidence in result (%)	80%	Adjusted gain	1.60	Net present value	1.58					
<i>Threatened species</i>																									
Number of features e.g. Nest hollows, habitat trees	No																								
Condition of habitat Change in habitat condition, but no change in extent	No																								
Birth rate e.g. Change in nest success	No																								
Mortality rate e.g. Change in number of road kills per year	No																								
Number of individuals e.g. Individual plants/animals	No																								

Summary							
Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost (\$)		
					Direct offset (\$)	Other compensatory measures (\$)	Total (\$)
Birth rate	0				\$0.00		\$0.00
Mortality rate	0				\$0.00		\$0.00
Number of individuals	0				\$0.00		\$0.00
Number of features	0				\$0.00		\$0.00
Condition of habitat	0				\$0.00		\$0.00
Area of habitat	18.97	19.62	103.44%	Yes	\$0.00	N/A	\$0.00
Area of community	0				\$0.00		\$0.00
					\$0.00	\$0.00	\$0.00

Offsets Assessment Guide

For use in determining offsets under the *Environment Protection and Biodiversity Conservation Act 1999*
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Matter of National Environmental Significance	
Name	Waxy Cabbage Palm
EPBC Act status	Vulnerable
Annual probability of extinction <small>Based on IUCN category definitions</small>	0.2%

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator						
Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
<i>Ecological communities</i>						
Area of community	No		Area			
			Quality			
			Total quantum of impact	0.00		
<i>Threatened species habitat</i>						
Area of habitat	Yes	Waxy Cabbage Palm Habitat	Area	27.1	Hectares	Carmichael Coal Mine Ecological Equivalence Assessment (ELA 2014) Impacts for Stage 1 calculated by CO2 Australia Limited
			Quality	7	Scale 0-10	
			Total quantum of impact	18.97	Adjusted hectares	
Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
Number of features e.g. Nest hollows, habitat trees	No					
Condition of habitat Change in habitat condition, but no change in extent	No					
<i>Threatened species</i>						
Birth rate e.g. Change in nest success	No					
Mortality rate e.g. Change in number of road kills per year	No					
Number of individuals e.g. Individual plants/animals	No					

Offset calculator																													
Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start area and quality	Future area and quality without offset	Future area and quality with offset	Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source													
<i>Ecological Communities</i>																													
Area of community	No				Risk-related time horizon (max. 20 years)	Start area (hectares)	Risk of loss (%) without offset	Risk of loss (%) with offset																					
					Future area without offset (adjusted hectares)	0.0	Future area with offset (adjusted hectares)	0.0																					
					Time until ecological benefit	Start quality (scale of 0-10)	Future quality without offset (scale of 0-10)	Future quality with offset (scale of 0-10)																					
<i>Threatened species habitat</i>																													
Area of habitat	Yes	18.97	Adjusted hectares	Moray Downs West Stage 1 Offset Area	Time over which loss is averted (max. 20 years)	20	Start area (hectares)	336.4942	Risk of loss (%) without offset	40%	Risk of loss (%) with offset	20%	Raw gain	67.30	Confidence in result (%)	80%	Adjusted gain	53.84	Net present value	51.73	% of impact offset	73.37	Minimum (90%) direct offset requirement met?	Yes	Cost (\$ total)		Information source		
					Future area without offset (adjusted hectares)	201.9	Future area with offset (adjusted hectares)	269.2																					
					Time until ecological benefit	5	Start quality (scale of 0-10)	7	Future quality without offset (scale of 0-10)	6	Future quality with offset (scale of 0-10)	8	Raw gain	2.00	Confidence in result (%)	80%	Adjusted gain	1.60	Net present value	1.58									
Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start value	Future value without offset	Future value with offset	Raw gain	Confidence in result (%)	Adjusted gain	Net present value	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source													
Number of features e.g. Nest hollows, habitat trees	No																												
Condition of habitat Change in habitat condition, but no change in extent	No																												
<i>Threatened species</i>																													
Birth rate e.g. Change in nest success	No																												
Mortality rate e.g. Change in number of road kills per year	No																												
Number of individuals e.g. Individual plants/animals	No																												

Summary							
Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost (\$)		
					Direct offset (\$)	Other compensatory measures (\$)	Total (\$)
Birth rate	0				\$0.00		\$0.00
Mortality rate	0				\$0.00		\$0.00
Number of individuals	0				\$0.00		\$0.00
Number of features	0				\$0.00		\$0.00
Condition of habitat	0				\$0.00		\$0.00
Area of habitat	18.97	73.37	386.75%	Yes	\$0.00	N/A	\$0.00
Area of community	0				\$0.00		\$0.00
					\$0.00	\$0.00	\$0.00

Offsets Assessment Guide

For use in determining offsets under the *Environment Protection and Biodiversity Conservation Act 1999*
2 October 2012
This guide relies on Macros being enabled in your browser.

Matter of National Environmental Significance	
Name	Yakka skink
EPBC Act status	Vulnerable
Annual probability of extinction <small>Based on IUCN category definitions</small>	0.2%

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator						
Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
<i>Ecological communities</i>						
Area of community	No		Area			
			Quality			
			Total quantum of impact	0.00		
<i>Threatened species habitat</i>						
Area of habitat	Yes	Yakka Skink Habitat	Area	1859	Hectares	Carmichael Coal Mine Ecological Equivalence Assessment (ELA 2014) Impacts for Stage 1 calculated by CO2 Australia Limited
			Quality	6	Scale 0-10	
			Total quantum of impact	#####	Adjusted hectares	
<i>Threatened species</i>						
Birth rate e.g. Change in nest success	No					
Mortality rate e.g. Change in number of road kills per year	No					
Number of individuals e.g. Individual plants/animals	No					

Offset calculator																									
Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start area and quality	Future area and quality without offset	Future area and quality with offset	Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source									
<i>Ecological Communities</i>																									
Area of community	No				Risk-related time horizon (max. 20 years)	Start area (hectares)	Risk of loss (%) without offset	Risk of loss (%) with offset																	
					Future area without offset (adjusted hectares)	0.0	Future area with offset (adjusted hectares)	0.0																	
					Time until ecological benefit	Start quality (scale of 0-10)	Future quality without offset (scale of 0-10)	Future quality with offset (scale of 0-10)																	
<i>Threatened species habitat</i>																									
Area of habitat	Yes	1115.21	Adjusted hectares	Moray Downs West Stage 1 Offset Area	Time over which loss is averted (max. 20 years)	20	Start area (hectares)	5600	Risk of loss (%) without offset	40%	Risk of loss (%) with offset	20%	Raw gain	1120.00	Confidence in result (%)	80%	Adjusted gain	896.00	Net present value	\$60.90	1134.89	101.76%	Yes		
					Future area without offset (adjusted hectares)	3360.0	Future area with offset (adjusted hectares)	4480.0																	
					Time until ecological benefit	5	Start quality (scale of 0-10)	6	Future quality without offset (scale of 0-10)	5	Future quality with offset (scale of 0-10)	7	2.00	80%	1.60	1.58									
<i>Threatened species</i>																									
Birth rate e.g. Change in nest success	No																								
Mortality rate e.g. Change in number of road kills per year	No																								
Number of individuals e.g. Individual plants/animals	No																								

Summary							
Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost (\$)		
					Direct offset (\$)	Other compensatory measures (\$)	Total (\$)
Birth rate	0				\$0.00		\$0.00
Mortality rate	0				\$0.00		\$0.00
Number of individuals	0				\$0.00		\$0.00
Number of features	0				\$0.00		\$0.00
Condition of habitat	0				\$0.00		\$0.00
Area of habitat	1115.208	1134.89	101.76%	Yes	\$0.00	N/A	\$0.00
Area of community	0				\$0.00		\$0.00
					\$0.00	\$0.00	\$0.00

Offsets Assessment Guide

For use in determining offsets under the *Environment Protection and Biodiversity Conservation Act 1999*
2 October 2012
This guide relies on Macros being enabled in your browser.

Matter of National Environmental Significance	
Name	yakka skink
EPBC Act status	Vulnerable
Annual probability of extinction Based on IUCN category definitions	0.2%

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator						
Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
<i>Ecological communities</i>						
Area of community	No		Area			
			Quality			
			Total quantum of impact	0.00		
<i>Threatened species habitat</i>						
Area of habitat	Yes	Yakka Skink Habitat	Area	1859	Hectares	Carmichael Coal Mine Ecological Equivalence Assessment (ELA 2014) Impacts for Stage 1 calculated by CO2 Australia Limited
			Quality	6	Scale 0-10	
			Total quantum of impact	#####	Adjusted hectares	
<i>Threatened species</i>						
Birth rate e.g. Change in nest success	No					
Mortality rate e.g. Change in number of road kills per year	No					
Number of individuals e.g. Individual plants/animals	No					

Offset calculator																											
Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start area and quality	Future area and quality without offset	Future area and quality with offset	Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source											
<i>Ecological Communities</i>																											
Area of community	No				Risk-related time horizon (max. 20 years)	Start area (hectares)	Risk of loss (%) without offset	Risk of loss (%) with offset																			
					Future area without offset (adjusted hectares)	0.0	Future area with offset (adjusted hectares)	0.0																			
					Time until ecological benefit	Start quality (scale of 0-10)	Future quality without offset (scale of 0-10)	Future quality with offset (scale of 0-10)																			
<i>Threatened species habitat</i>																											
Area of habitat	Yes	1115.21	Adjusted hectares	Moray Downs West Stage 1 Offset Area	Time over which loss is averted (max. 20 years)	20	Start area (hectares)	21480.82	Risk of loss (%) without offset	40%	Risk of loss (%) with offset	20%	Raw gain	4296.16	Confidence in result (%)	80%	Adjusted gain	3436.93	Net present value	3302.30	% of impact offset	4353.27	390.35%	Yes			
					Future area without offset (adjusted hectares)	12888.5	Future area with offset (adjusted hectares)	17184.7																			
					Time until ecological benefit	5	Start quality (scale of 0-10)	6	Future quality without offset (scale of 0-10)	5	Future quality with offset (scale of 0-10)	7	Raw gain	2.00	Confidence in result (%)	80%	Adjusted gain	1.60	Net present value	1.58							
<i>Threatened species</i>																											
Birth rate e.g. Change in nest success	No																										
Mortality rate e.g. Change in number of road kills per year	No																										
Number of individuals e.g. Individual plants/animals	No																										

Summary							
Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost (\$)		
					Direct offset (\$)	Other compensatory measures (\$)	Total (\$)
Birth rate	0				\$0.00		\$0.00
Mortality rate	0				\$0.00		\$0.00
Number of individuals	0				\$0.00		\$0.00
Number of features	0				\$0.00		\$0.00
Condition of habitat	0				\$0.00		\$0.00
Area of habitat	1115.208	4353.27	390.35%	Yes	\$0.00	N/A	\$0.00
Area of community	0				\$0.00		\$0.00
					\$0.00	\$0.00	\$0.00

s47G(1)(a), s47(1)(b), s47F

APPENDIX A EPBC ACT GUIDE FOR IMPACTS ON CRITICAL HABITAT (CRITICAL HABITAT OFFSET)

Offsets Assessment Guide

For use in determining offsets under the *Environment Protection and Biodiversity Conservation Act 1999*
2 October 2012
This guide relies on Macros being enabled in your browser.

Matter of National Environmental Significance	
Name	Black-throated finch
EPBC Act status	Endangered
Annual probability of extinction Based on IUCN category definitions	1.2%

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator						
Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
<i>Ecological communities</i>						
Area of community	No		Area			
			Quality			
			Total quantum of impact	0.00		
<i>Threatened species habitat</i>						
Area of habitat	Yes	Black throated finch - CRITICAL HABITAT	Area	4628	Hectares	Stage 1 Impacts prepared by ELA January 2016. Habitat quality score prepared by CO2 January 2016.
			Quality	8	Scale 0-10	
			Total quantum of impact	####	Adjusted hectares	
<i>Threatened species</i>						
Birth rate e.g. Change in nest success	No					
Mortality rate e.g. Change in number of road kills per year	No					
Number of individuals e.g. Individual plants/animals	No					

Offset calculator																									
Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start area and quality	Future area and quality without offset	Future area and quality with offset	Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source									
<i>Ecological Communities</i>																									
Area of community	No				Risk-related time horizon (max. 20 years)	Start area (hectares)	Risk of loss (%) without offset	Risk of loss (%) with offset																	
					Future area without offset (adjusted hectares)	0.0	Future area with offset (adjusted hectares)	0.0																	
					Time until ecological benefit	Start quality (scale of 0-10)	Future quality without offset (scale of 0-10)	Future quality with offset (scale of 0-10)																	
<i>Threatened species habitat</i>																									
Area of habitat	Yes	3702.58	Adjusted hectares	Stage 1 Offset Area Moray Downs West CRITICAL HABITAT as defined by ELA January 2016	Time over which loss is averted (max. 20 years)	20	Start area (hectares)	10533.69	Risk of loss (%) without offset	40%	Risk of loss (%) with offset	20%	Raw gain	2106.74	Confidence in result (%)	90%	Adjusted gain	1896.06	Net present value	1493.63	2416.04	65.25%	No		
					Future area without offset (adjusted hectares)	6320.2	Future area with offset (adjusted hectares)	8427.0																	
					Time until ecological benefit	5	Start quality (scale of 0-10)	8	Future quality without offset (scale of 0-10)	7	Future quality with offset (scale of 0-10)	9	2.00	90%	1.80	1.70									
<i>Threatened species</i>																									
Birth rate e.g. Change in nest success	No																								
Mortality rate e.g. Change in number of road kills per year	No																								
Number of individuals e.g. Individual plants/animals	No																								

Summary							
Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost (\$)		
					Direct offset (\$)	Other compensatory measures (\$)	Total (\$)
Birth rate	0				\$0.00		\$0.00
Mortality rate	0				\$0.00		\$0.00
Number of individuals	0				\$0.00		\$0.00
Number of features	0				\$0.00		\$0.00
Condition of habitat	0				\$0.00		\$0.00
Area of habitat	3702.584	2416.04	65.25%	No	\$0.00	#DIV/0!	#DIV/0!
Area of community	0				\$0.00		\$0.00
					\$0.00	#DIV/0!	#DIV/0!

APPENDIX B EPBC ACT GUIDE FOR IMPACTS ON CRITICAL HABITAT (CORE HABITAT OFFSET)

Offsets Assessment Guide

For use in determining offsets under the *Environment Protection and Biodiversity Conservation Act 1999*
2 October 2012
This guide relies on Macros being enabled in your browser.

Matter of National Environmental Significance	
Name	Black-throated finch
EPBC Act status	Endangered
Annual probability of extinction Based on IUCN category definitions	1.2%

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator						
Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
<i>Ecological communities</i>						
Area of community	No		Area			
			Quality			
			Total quantum of impact	0.00		
<i>Threatened species habitat</i>						
Area of habitat	Yes	Black throated finch CRITICAL HABITAT	Area	1608	Hectares	Stage 1 Impacts prepared by ELA January 2016. Habitat quality score prepared by CO2 January 2016.
			Quality	8	Scale 0-10	
			Total quantum of impact	####	Adjusted hectares	
Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
Number of features e.g. Nest hollows, habitat trees	No					
Condition of habitat Change in habitat condition, but no change in extent	No					
<i>Threatened species</i>						
Birth rate e.g. Change in nest success	No					
Mortality rate e.g. Change in number of road kills per year	No					
Number of individuals e.g. Individual plants/animals	No					

Offset calculator																									
Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start area and quality	Future area and quality without offset	Future area and quality with offset	Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source									
<i>Ecological Communities</i>																									
Area of community	No				Risk-related time horizon (max. 20 years)	Start area (hectares)	Risk of loss (%) without offset	Risk of loss (%) with offset																	
					Future area without offset (adjusted hectares)	0.0	Future area with offset (adjusted hectares)	0.0																	
					Time until ecological benefit	Start quality (scale of 0-10)	Future quality without offset (scale of 0-10)	Future quality with offset (scale of 0-10)																	
<i>Threatened species habitat</i>																									
Area of habitat	Yes	1286.65	Adjusted hectares	Stage 1 offset Morry Downs West CORE HABITAT as defined by ELA January 2016	Time over which loss is averted (max. 20 years)	20	Start area (hectares)	4869.86	Risk of loss (%) without offset	40%	Risk of loss (%) with offset	20%	Raw gain	973.97	Confidence in result (%)	90%	Adjusted gain	876.57	Net present value	690.52	1323.42	102.86%	Yes		
					Future area without offset (adjusted hectares)	2921.9	Future area with offset (adjusted hectares)	3895.9																	
					Time until ecological benefit	5	Start quality (scale of 0-10)	7	Future quality without offset (scale of 0-10)	6	Future quality with offset (scale of 0-10)	9	3.00	85%	2.55	2.40									
Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start value	Future value without offset	Future value with offset	Raw gain	Confidence in result (%)	Adjusted gain	Net present value	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source									
Number of features e.g. Nest hollows, habitat trees	No																								
Condition of habitat Change in habitat condition, but no change in extent	No																								
<i>Threatened species</i>																									
Birth rate e.g. Change in nest success	No																								
Mortality rate e.g. Change in number of road kills per year	No																								
Number of individuals e.g. Individual plants/animals	No																								

Summary							
Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost (\$)		
					Direct offset (\$)	Other compensatory measures (\$)	Total (\$)
Birth rate	0				\$0.00		\$0.00
Mortality rate	0				\$0.00		\$0.00
Number of individuals	0				\$0.00		\$0.00
Number of features	0				\$0.00		\$0.00
Condition of habitat	0				\$0.00		\$0.00
Area of habitat	1286.648	1323.42	102.86%	Yes	\$0.00	N/A	\$0.00
Area of community	0				\$0.00		\$0.00
					\$0.00	\$0.00	\$0.00

APPENDIX C EPBC ACT GUIDE FOR IMPACTS ON CORE HABITAT

Offsets Assessment Guide

For use in determining offsets under the *Environment Protection and Biodiversity Conservation Act 1999*
2 October 2012
This guide relies on Macros being enabled in your browser.

Matter of National Environmental Significance	
Name	Black-throated finch
EPBC Act status	Endangered
Annual probability of extinction Based on IUCN category definitions	1.2%

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator						
Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
<i>Ecological communities</i>						
Area of community	No		Area			
			Quality			
			Total quantum of impact	0.00		
<i>Threatened species habitat</i>						
Area of habitat	Yes	Black throated finch - Impact on CORE HABITAT	Area	725.8	Hectares	Stage 1 Impacts prepared by ELA January 2016. Habitat quality score prepared by CO2 January 2016.
			Quality	7	Scale 0-10	
			Total quantum of impact	508.08	Adjusted hectares	
Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
Number of features e.g. Nest hollows, habitat trees	No					
Condition of habitat Change in habitat condition, but no change in extent	No					
<i>Threatened species</i>						
Birth rate e.g. Change in nest success	No					
Mortality rate e.g. Change in number of road kills per year	No					
Number of individuals e.g. Individual plants/animals	No					

Offset calculator																														
Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start area and quality	Future area and quality without offset	Future area and quality with offset	Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source														
<i>Ecological Communities</i>																														
Area of community	No				Risk-related time horizon (max. 20 years)	Start area (hectares)	Risk of loss (%) without offset	Risk of loss (%) with offset																						
					Future area without offset (adjusted hectares)	0.0	Future area with offset (adjusted hectares)	0.0																						
					Time until ecological benefit	Start quality (scale of 0-10)	Future quality without offset (scale of 0-10)	Future quality with offset (scale of 0-10)																						
<i>Threatened species habitat</i>																														
Area of habitat	Yes	508.08	Adjusted hectares	Stage 1 Offset Moray Downs West CORE HABITAT as defined by ELA January 2016	Time over which loss is averted (max. 20 years)	20	Start area (hectares)	1950	Risk of loss (%) without offset	40%	Risk of loss (%) with offset	20%	Raw gain	390.00	Confidence in result (%)	90%	Adjusted gain	351.00	Net present value	276.50	% of impact offset	529.93	104.30%	Minimum (90%) direct offset requirement met?	Yes	Cost (\$ total)		Information source		
					Future area without offset (adjusted hectares)	1170.0	Future area with offset (adjusted hectares)	1560.0																						
					Time until ecological benefit	5	Start quality (scale of 0-10)	7	Future quality without offset (scale of 0-10)	6	Future quality with offset (scale of 0-10)	9	Raw gain	3.00	Confidence in result (%)	85%	Adjusted gain	2.55	Net present value	2.40										
Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start value	Future value without offset	Future value with offset	Raw gain	Confidence in result (%)	Adjusted gain	Net present value	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source														
Number of features e.g. Nest hollows, habitat trees	No																													
Condition of habitat Change in habitat condition, but no change in extent	No																													
<i>Threatened species</i>																														
Birth rate e.g. Change in nest success	No																													
Mortality rate e.g. Change in number of road kills per year	No																													
Number of individuals e.g. Individual plants/animals	No																													

Summary							
Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost (\$)		
					Direct offset (\$)	Other compensatory measures (\$)	Total (\$)
Birth rate	0				\$0.00		\$0.00
Mortality rate	0				\$0.00		\$0.00
Number of individuals	0				\$0.00		\$0.00
Number of features	0				\$0.00		\$0.00
Condition of habitat	0				\$0.00		\$0.00
Area of habitat	508.081	529.93	104.30%	Yes	\$0.00	N/A	\$0.00
Area of community	0				\$0.00		\$0.00
					\$0.00	\$0.00	\$0.00

APPENDIX D EPBC ACT GUIDE FOR IMPACTS ON MARGINAL HABITAT

Offsets Assessment Guide

For use in determining offsets under the *Environment Protection and Biodiversity Conservation Act 1999*
2 October 2012
This guide relies on Macros being enabled in your browser.

Matter of National Environmental Significance	
Name	Black-throated finch
EPBC Act status	Endangered
Annual probability of extinction <small>Based on IUCN category definitions</small>	1.2%

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator						
Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
<i>Ecological communities</i>						
Area of community	No		Area			
			Quality			
			Total quantum of impact	0.00		
<i>Threatened species habitat</i>						
Area of habitat	Yes	Black throated finch - Impact on MARGINAL HABITAT	Area	739.3	Hectares	Stage 1 Impacts prepared by ELA January 2016. Habitat quality score prepared by CO2 January 2016.
			Quality	6	Scale 0-10	
			Total quantum of impact	443.59	Adjusted hectares	
<i>Threatened species</i>						
Number of features e.g. Nest hollows, habitat trees	No					
Condition of habitat Change in habitat condition, but no change in extent	No					
Birth rate e.g. Change in nest success	No					
Mortality rate e.g. Change in number of road kills per year	No					
Number of individuals e.g. Individual plants/animals	No					

Offset calculator																											
Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start area and quality	Future area and quality without offset	Future area and quality with offset	Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source											
<i>Ecological Communities</i>																											
Area of community	No				Risk-related time horizon (max. 20 years)	Start area (hectares)	Risk of loss (%) without offset	Risk of loss (%) with offset																			
					Future area without offset (adjusted hectares)	0.0	Future area with offset (adjusted hectares)	0.0																			
					Time until ecological benefit	Start quality (scale of 0-10)	Future quality without offset (scale of 0-10)	Future quality with offset (scale of 0-10)																			
<i>Threatened species habitat</i>																											
Area of habitat	Yes	443.59	Adjusted hectares	Stage 1 Offset Area Moray Downs West MARGINAL HABITAT as defined by ELA January 2016	Time over which loss is averted (max. 20 years)	20	Start area (hectares)	2930.68	Risk of loss (%) without offset	40%	Risk of loss (%) with offset	20%	Raw gain	586.14	Confidence in result (%)	90%	Adjusted gain	527.52	Net present value	415.56	% of impact offset	509.39	114.83%	Yes			
					Future area without offset (adjusted hectares)	1758.4	Future area with offset (adjusted hectares)	2344.5																			
					Time until ecological benefit	10	Start quality (scale of 0-10)	6	Future quality without offset (scale of 0-10)	5	Future quality with offset (scale of 0-10)	7	Raw gain	2.00	Confidence in result (%)	70%	Adjusted gain	1.40	Net present value	1.24							
<i>Threatened species</i>																											
Number of features e.g. Nest hollows, habitat trees	No																										
Condition of habitat Change in habitat condition, but no change in extent	No																										
Birth rate e.g. Change in nest success	No																										
Mortality rate e.g. Change in number of road kills per year	No																										
Number of individuals e.g. Individual plants/animals	No																										

Summary							
Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost (\$)		
					Direct offset (\$)	Other compensatory measures (\$)	Total (\$)
Birth rate	0				\$0.00		\$0.00
Mortality rate	0				\$0.00		\$0.00
Number of individuals	0				\$0.00		\$0.00
Number of features	0				\$0.00		\$0.00
Condition of habitat	0				\$0.00		\$0.00
Area of habitat	443.592	509.39	114.83%	Yes	\$0.00	N/A	\$0.00
Area of community	0				\$0.00		\$0.00
					\$0.00	\$0.00	\$0.00