RECOVERY TEAM ANNUAL REPORT THREATENED SPECIES AND/OR COMMUNITIES RECOVERY TEAM				
Recovery Team	Numbat Recovery Team			
Reporting Period Submission date 24 April	**DATE FROM:**	**1st April 2014**	**DATE TO:**	**31st March 2015**

Current membership		
Member		**Representing**
Chair	Tony Friend	Parks & Wildlife Animal Science Program
	Brett Beecham	Parks & Wildlife Wheatbelt Region
	Rob Brazell	Parks & Wildlife Wellington District
	Matt Cameron	NSW OEH
	Peter Collins	Parks & Wildlife Albany District
	Peter Copley	SA DENR
	Dani Jose	Perth Zoo
	Simon Martin	Parks & Wildlife Wellington District
	Peter Mawson	Perth Zoo
	Chris Murphy	Project Numbat
	Rebecca Ong	Parks & Wildlife Perth Hills District
	Manda Page	Parks & Wildlife Species and Communities Branch
	Kylie Piper	Arid Recovery
	Juanita Renwick	Parks & Wildlife Western Shield
	David Roshier	Australian Wildlife Conservancy
	Neil Thomas	Parks & Wildlife Animal Science Program

	Ian Wilson	Parks & Wildlife Donnelly District
Dates meetings were held	26th August 2014 and 30th March 2015	
Highlights of achievements for the previous 12 months suitable for publication in *WATSNU* and contribution to DEC annual report. Provide 1-2 paragraphs summarising total number of new populations located, surveys completed, list major management actions etc	Numbats bred at Perth Zoo from Dryandra stock were released into Dryandra Woodland in November and December 2014 to reinforce the population there. Survival amongst the group of 17 released animals has been high, with the four deaths recorded due to native predators, birds of prey and carpet pythons. Infrequent records of cats in trapping and camera surveys, together with the lack of numbat predation by cats indicates that recent cat control with Eradicat® baits and trapping has made an impact on cats, the greatest source of numbat mortality at Dryandra in 2012/13.	

List of recovery actions coordinated by Recovery Team

Action 1 Management of existing populations and habitat.

Habitat management

Fox control, fire management and visitor management, where appropriate, were carried out at the eight Parks & Wildlife-managed sites that support or have recently supported numbat populations (Dryandra, Boyagin, Tutanning, Perup, Dragon Rocks, Stirling Range, Cocanarup and Batalling). The Australian Wildlife Conservancy (AWC) manages two fenced wildlife sanctuaries (Yookamurra in South Australia and Scotia in NSW) that are free of foxes and feral cats and support reintroduced numbat populations. AWC has also fenced an area within the Mount Gibson sanctuary with the intention of releasing numbats, amongst other species, and during 2014 entered the final stages of removing introduced mammals from the enclosure.

Monthly fox control by 1080 ground baiting is carried out at Dryandra Woodland, Boyagin and Tutanning Nature Reserves, within Cocanarup Timber Reserve and adjacent Unallocated Crown Land and in part of the Batalling area. Quarterly fox control by aerial baiting continues at Dragon Rocks Nature Reserve, Stirling Range National Park, Perup Nature Reserve/Greater Kingston National Park and surrounding areas and in State forest in the Batalling area. All of these sites support numbat populations or have been subject to recent translocations.

A review of the Western Shield baiting program in 2012 to manage increasing costs proposed the cessation of baiting in Dragon Rocks Nature Reserve due to the paucity of Critical Weight Range mammal captures during recent monitoring. Baiting was to continue, however, if numbat sign was found during a survey carried out in December 2012. Although this survey yielded no numbat sign, numbats appeared in images collected by sensor cameras in the reserve in June and December 2013, showing that this reintroduced population persists. Dragon Rocks has now been placed back on the regular baiting schedule.

In some numbat sites managed by Parks & Wildlife, prescribed burning is carried out for hazard reduction and environmental outcomes (e.g. regeneration of kwongan and threatened flora management).

Numbat monitoring

Monitoring of existing populations is an integral part of their management and driven surveys were carried out in Dryandra in April and November 2014, while a number of radio-collared numbats were monitored there through the year. Two sightings were made in April but only one in November (2013 figures: 3 in April and 2 in November). The November survey is timed to coincide with the increased numbers after the weaning of the year's young, so it generally results in more sightings that the April survey. In November 2014, however the weather was cold and rainy for 3 of the 4 days and the only sighting was made on the fine day. While the November result may underestimate the true situation, numbat sighting rates at Dryandra clearly remain

low, well below 1 sighting/100 km. This continuing situation is of concern as Dryandra holds the most genetically valuable numbat population. Driven surveys were also carried out at Yookamurra and Scotia Sanctuaries. Population estimates for the AWC properties in the December 2014 census were 169 numbats at Scotia (Stage 1, 89 animals; Stage 2, 80 animals) and 44 at Yookamurra.

Diggings surveys are also used to monitor numbats, particularly at sites where very low numbers or dense vegetation preclude driven surveys. A diggings survey was carried out at Boyagin Nature Reserve in November 2014, during a training exercise for Project Numbat volunteers. Diggings were widespread in both blocks of Boyagin and were particularly abundant in the west block, indicating a healthy population. A diggings survey was also carried out in Dryandra's Montague Block by the Project Numbat team, resulting in the location of several sites occupied by numbats.

Numbat sighting reports are submitted regularly to Parks & Wildlife by Departmental staff and the members of the public from Perup/Kingston, Batalling and Boyagin, indicating that these populations are healthy. The Perup/Kingston population, in particular, is doing well, with recent sighting reports indicating an expansion of range, significantly to the south-east, into Parks & Wildlife's Frankland District. Numbats are frequently seen within the 400-hectare Perup Sanctuary. No further survey has been carried out at Dragon Rocks or Tutanning Nature reserves since the capture of numbat images at both reserves in 2013.

Predator control research

In the response to the dramatic decline in the Dryandra numbat population described in the 2009 report of the Numbat Recovery Team, a project commenced in October 2010, aiming to determine whether predation by cats is the cause and if so to devise and implement a cat control strategy in Dryandra. In a two-year intensive study of causes of mortality in numbats and woylies, strong evidence that cats are now the most important predators of both species was obtained. The next phase of research involves determining the effectiveness of baiting with Eradicat® in controlling cats in Dryandra, as well as evaluating the risk it poses to non-target species.

The progress of this study has been described in previous annual reports. In 2014 the elements continuing were the study of the effectiveness of Eradicat® baiting at Dryandra and Tutanning in poisoning cats, while at the same time, chuditch were collared at Dryandra to collect further data on their ability to survive Eradicat® baiting.

Baiting trials with toxic Eradicat® baits were carried out in May 2014 at both Dryandra and Tutanning. Cats were captured beforehand (three at Dryandra, five at Tutanning) and fitted with VHF collars to monitor their survival or mortality through the baiting. As in previous years, baits were distributed by hand in a pattern that simulates an aircraft drop, at a density of 50/km^2. Three collared cats remained alive and transmitting at Dryandra and four at Tutanning when Eradicat® baits were distributed. No cat at either site died due to consumption of a cat bait. Four chuditch were collared at Dryandra prior to the 2014 baiting but only one was still transmitting immediately beforehand – it survived the baiting.

This work will continue in 2015. In preparation for the 2015 baiting, four cats were captured at Dryandra in October 2014, one in January and six in March 2015, while at Tutanning four cats and two foxes were captured in January and two more foxes in March 2015. All were fitted with GPS collars.

Action 2 Genetic survey of existing populations.

Ear tissue for DNA analysis is collected routinely from all numbats handled in all populations. A genetic study of original and reintroduced populations will be carried out in 2015.

Action 3 Translocations to establish at least six further self-sustaining populations

This action is listed in the 1994 recovery plan, when there were two existing (Dryandra and Perup) and one reintroduced population (Boyagin). Four other translocations were in their early stages (Karroun Hill, Tutanning, Batalling and Yookamurra (now AWC)). Since 1994, new translocations have been carried out to Karakamia Sanctuary (AWC), Dragon Rocks Nature Reserve, Dale Conservation Park, Stirling Range National

Park, Scotia Sanctuary (AWC) and Cocanarup Timber Reserve.

In 2013, nine young female numbats from the breeding program at Perth Zoo were used to top-up the reintroduced population in the Batalling area. In recent years, there have been regular sightings of numbats along the baiting route in Hillman block. The numbats, fitted with radio-collars a week earlier, were released into pre-selected hollow logs near Varis and Steed Roads in the Batalling area on 5th December 2013. The radio-collared numbats were difficult to find. Three aerial searches were carried out in 2014, on 3rd February, 14th April and 3rd September. The cost of two flights was met by a generous donation from Project Numbat and the cost of one was shared between Wellington District and the Animal Science Program. The last flight covered around 1000 km^2 of State forest and farmland centred on the release areas, searching up to 30 km away. Three of the nine transmitters were found, all within 5 kilometres of their release points. On 3rd February after the first flight, one numbat was found alive and another transmitter was beneath a large log. When this collar was retrieved, it showed the characteristic marks of chuditch teeth. The numbat found alive was not located again in searches on the ground or on either subsequent flight. A third collar was located during the flight on 3rd September. It was found on the ground, bearing the tell-tale marks of raptor predation. It is thought that the other numbats may have dispersed to sites outside the search area.

Due to the very low population level at Dryandra and as other sites were not ready for a release, the Recovery Team recommended that the numbats available from the breeding colony in 2014 be used to reinforce the Dryandra population. Three males that had been held over from 2013 for release in spring 2014 at Batalling were included in the Dryandra release due to the poor success in finding the Batalling females. These three animals were released into the main block of Dryandra on 19th November 2014.

The main release, of 13 young of 2014, was carried out on 5th December. Release logs at four sites in the main block had been selected previously and the numbats were each placed into a separate log in the late afternoon. Two additional young were held over at the zoo for different reasons and released on 18th December into two of the release logs used earlier. Radio-collars were funded by Project Numbat and fitted at Perth Zoo a week before the release, providing a media opportunity in which the Environment Minister participated.

Around half of the numbats were located by ground searching after they dispersed from the release sites. A radio-tracking flight on was carried out 6th February 2015, funded through a generous donation from Project Numbat. To date only four of the 18 released numbats are still to be accounted for. The fates of other 14 animals, as currently known, are: 9 alive, 4 dead (two predated by pythons, two by raptors), and one possibly pulled its collar off (maybe predation but no marks or predator DNA on the collar). These results are promising, as the survival rate is high compared with releases at other sites and the lack of predation by cats or foxes indicates that predator control is working well.

A 7000-hectare exclosure has now been built at AWC's Mt Gibson property and removal of foxes and cats inside the fence is nearing completion. The numbat is amongst the species proposed for reintroduction into the fenced area. Mt Gibson is close to Karroun Hill Nature Reserve, where a reintroduced numbat population survived for a number of years in the 1980s and 1990s and shares many of the vegetation associations found there.

Action 4 Disease survey and health monitoring of all populations.

A comprehensive disease survey of numbat populations in WA was carried out during the 1990s. Some health monitoring is continuing, both on the captive population and through regular monitoring of the current translocation. Although a female numbat at Dryandra was found to have died from an erysipelas infection in 2011, this appears to have been an isolated case. No significant disease issues have emerged in recent years.

Action 5 Captive breeding to provide animals for display and to supplement the translocation program if necessary.

Since the peak and crash of the numbat population at Dryandra in 1993, the collaborative breeding program at Perth Zoo has been the primary source of stock for the translocation program in Western Australia. This program is funded entirely by Perth Zoo. A numbat display has been maintained at Perth Zoo throughout that

time and is a very important part of the Recovery Team's awareness-raising program.

The breeding program continued in 2014, providing 17 numbats for release at Dryandra in November-December. The captive colony was reinforced in November 2014 by the addition of a young male and a female numbat from the wild population at Dryandra. Unfortunately the female died of a twisted bowel soon afterwards. Despite regular additions of small numbers of wild numbats, the colony needs a large injection of animals from the wild, or perhaps a complete replacement of all animals to resolve relatedness problems.

A total of 25 young were born in early 2015 although four had been lost from pouches by the end of the reporting period.

Action 6 Establishment and support of public awareness and sponsorship programs.

Involvement in the activities of the Recovery Team by the community action group, Project Numbat (PN), has provided greater public awareness, extra funding through fund-raising and sponsorships, and also a source of volunteers. Parks & Wildlife, Perth Zoo and AWC provide support for PN's initiatives. Between 1st April 2014 and 31st March 2015, PN provided a total of $8150 for two projects – 1) purchase of 15 radio-collars to be fitted to numbats for translocation to Dryandra in November-December 2014 and 2) radio-tracking flights to locate numbats at Dryandra in February and March 2015. These donations have allowed the Numbat Recovery Program to continue, in a time of constrained budgets.

During the year, volunteers from PN and the community in general provided valuable assistance in field activities as part of Parks & Wildlife's numbat recovery activities including the Boyagin diggings survey.