KIMBERLEY GEMS:

purple-crowned fairy-wrens

by Bruce Greatwich, Tracy Sonneman and Allan Burbidge

A survey to detect numbers of purple-crowned fairy-wrens has given cause for optimism that the population of this enigmatic and attractive little bird is increasing. And, thanks to a collaboration between DBCA, World Wildlife Fund and traditional owners, their future is looking brighter than ever.

The humidity is high and, even though it's only mid-morning, everyone is sweating profusely. We are stumbling over rocks and a tangle of roots, pushing through soft sand and thrusting our way past the serrated and spiky leaves of various plants adjacent to a slowly flowing stream fringed with dense pandanus plants. We strain to hear over the cacophony of bird calls. Then, as we push forward, an explosion of noise comes as something large splashes into the water and we immediately jump backwards; another unseen freshwater crocodile that had been basking in the sun makes a dash for the water. We push on, further upstream. In the distance we hear a faint but clear rollicking *tcheip-tcheip-tcheip-tcheip-tcheip*. Our hearts race as we continue forward and the call grows louder – it is the unmistakeable song of the purple-crowned fairy-wren (*Malurus coronatus*).

A FIRST ENCOUNTER

Soon, the female purple-crowned fairy-wren spots us – intruders in her habitat – and she advances to check us out. She is small – just 10 grams – and has white and cinnamon colours, a long tail strikingly deep turquoise blue, steely grey cap and deep chestnut ear patches. We are in the heart of her territory, which she will fearlessly defend, and she's determined to let us know it with her terse *tcheip-tcheip-tcheip-tcheip-tcheip*! Soon, another female joins her, then another, and another. Then, the real star of the show arrives – the breeding male. We watch in awe as the sunlight illuminates his brilliantly bright lilac-purple crown, which is contrasted by a black stripe through his eye and along the back of his neck. The group flits among the lime green pandanus leaves this species relies so heavily on. Barely staying still for even a second, the birds approach us to within a metre and dance around us. Our disturbance is temporary; after we observe and count all the individuals present, we push on in search of the next family group of these enigmatic birds.

Back at Silent Grove campsite in King Leopold Ranges Conservation Park, the group of researchers – made up of ornithologists, DBCA nature conservation staff and traditional owners – excitedly discuss the day's events. For some of us, today has been our first unforgettable encounter with a purple-crowned fairy-wren. We enjoy a well-earned cold drink and rest our weary feet around the campfire, dwarfed by the 300 million-year-old King Leopold Ranges.

We will do it all again tomorrow, as we did the day before – walking up to 10 kilometres a day through the densely vegetated streamside habitat this species calls home. Despite the hard work, we know it will be worth it, as this multifaceted team has one thing in common: a passion for the conservation of this threatened species in the face of ever-increasing threats.

Left Purple-crowned fairy-wren.
Photo – David Bettini

Inset above Female purple-crowned fairy-wren with nest.
Photo – Bruce Greatwich/DBCA

PRECIOUS GEM

The western subspecies of the purple-crowned fairy-wren (*Malurus coronatus coronatus*) is listed as Endangered under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* and Endangered under the Western Australian *Wildlife Conservation Act 1950*. It is restricted to the Kimberley region and the Victoria River system in the Northern Territory, with a total estimated population of 7000 breeding individuals in the Kimberley region. The species is strictly confined to riparian habitat (vegetation directly associated with creeks and rivers), which is threatened by degradation by feral herbivores and intense bushfires. Programs already carried out in the Kimberley, together with those planned for the future, aim to address these threats through improved fire management practices and the removal of cattle and other feral animals such as donkeys and pigs.

Above The group camped under the stars while conducting surveys in remote areas of King Leopold Ranges Conservation Park. *Photo – Bruce Greatwich/DBCA*

SEARCHING FOR SCIENCE

Previous surveys have shown that a population of purple-crowned fairy-wrens, estimated at possibly less than 100 individuals, occurred within King Leopold Ranges Conservation Park along Bell Creek and Isdell River. However, the actual population size and distribution of individuals along the rivers was unknown. We implemented a targeted survey for the species, aiming to gather better data on the numbers and distribution of individuals in this catchment population. This information will assist with evaluating past management actions, and informing future decisions. The targeted survey was completed thanks to a strong collaboration between field staff from DBCA's West Kimberley District and Perth-based science staff who worked with traditional owners and the World Wildlife Fund.

The northern half of King Leopold Ranges Conservation Park sits within the Wanjina – Wunggurr Wilinggin native title area, Country that still has strong cultural ties for the traditional owners. The survey was undertaken with assistance from Wunggurr rangers and Wilinggin Aboriginal Corporation staff members as a capacity-building project. These team members provided valuable cultural insight, such as pointing out dragon trees (*Sesbania formosa*) and identifying their medicinal uses. Through the program, the traditional owners gained the skills and experience to survey for purple-crowned fairy-wrens in other areas of their Country.

The group carried out the survey by walking along the riparian zone until they encountered likely purple-crowned fairy-wren habitat. Within the Isdell River catchment (which includes Bell Creek and Isdell River), the species occurs in areas of dense pandanus (*Pandanus aquaticus*) and cane grass (*Mnesithea rottboellioides*). Where this habitat was encountered, a call playback survey was completed by broadcasting a recording of the purple-crowned fairy-wren call to illicit a vocal or visual response. Approval was obtained from the department's Animal Ethics Committee to undertake call playback surveys, a method that isn't encouraged outside of licensed research and monitoring due to possible disturbance to the species.

Much of the Kimberley is inaccessible by vehicle, so helicopters are the only means of travelling to large areas of remote country. As part of this project, they were used to survey remote sections on the lower Isdell River and for deployment and collection of staff who hiked upstream along remote parts of the Isdell River over a four-day period.

THE RESULTS ARE IN

More than 92 kilometres of riparian habitat was surveyed on foot, with numerous blisters collected along the way. A total of 499 call playback surveys were carried out, and purple-crowned fairy-wrens were observed at 69 of these sites. From the 69 sites, or 14 per cent, 170 individual birds were recorded; 107 from Isdell River and 63 from Bell Creek. These results have significantly improved the level of knowledge about the purple-crowned

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Above Helicopters were used to access remote areas of the survey site.
Photo – Allan Burbidge/DBCA

Above right Bowerbirds are also known to occur in the area.
Photo – Karen Bettink/DBCA

Right Unmanaged cattle degrade riparian habitat.
Photo – Bruce Greatwich/DBCA

fairy-wren within King Leopold Ranges Conservation Park and more broadly for the Isdell River catchment population. Previous population estimates provided for the Isdell River catchment by Anja Skroblin, who conducted field surveys as part of a PhD project on the species across the Kimberley (from 2007 to 2009), suggested an Isdell River catchment population of 85 to 147 individuals. It is therefore highly encouraging that 170 individuals were recorded within the conservation park alone.

The actual population located within the conservation park is likely to be higher, given not all areas of suitable riparian habitat were surveyed. A comparison of population trends can be made with surveys conducted in 2007 along Bell Creek, where approximately 17.5 kilometres of riparian habitat was surveyed and repeated during this project. In 2007, nine family groups consisting of 21 individuals were recorded. But in the current survey we saw 12 family groups and 31 individuals along this same stretch of habitat. While caution should be applied in determining a trend, it would suggest the population has been stable and may have increased in the last 10 years.

WHAT IT ALL MEANS

For the past decade, a greater focus has been made on landscape-scale approaches to managing bushfires across the Kimberley. Traditional Aboriginal burning methods, which consisted of many early dry season bushfires (March to July), reduced the fuel load and prevented landscape-scale damaging, late dry season bushfires. The cessation of Aboriginal burning methods following European settlement shifted the fire regime in the Kimberley, with less early dry season bushfires and more damaging late dry season bushfires (August to December). Prescribed burning implemented in recent years aims to replicate traditional burning regimes.

To achieve this, aircraft are used to drop capsules that ignite upon landing. With a strategic approach, a mosaic pattern of burnt and unburnt country results, meaning each late dry-season bushfire will be restricted to a smaller area and ideally extinguish itself once it hits prescribed burn areas achieved early in the dry season. Reducing late dry season bushfires is critical for the survival of the purple-crowned fairy-wren. The riparian habitat where the species lives can be highly flammable under certain conditions. And, as they are small and have a

Right Traditional owners played an important role in the survey and enjoyed the opportunity to reconnect with Country. Here, Sherwin Nulgit and Bruce Greatwich conduct a call playback survey in typical purple-crowned fairy-wren habitat.

Below Singing purple-crowned fairy-wren. *Photos – Karen Bettink/DBCA*

relatively poor flight capability, the species has limited dispersal potential.

Feral herbivores such as unmanaged cattle, donkeys and feral pigs also degrade riparian habitat. Soil substrate becomes weakened through trampling and digging, resulting in pandanus washing away during wet season floods. Grasses such as cane grass are eaten, leaving exposed riverbanks, reducing the amount of available habitat. Increased funding during the past five years led to more than 8000 unmanaged cattle, donkeys and pigs being removed from King Leopold Ranges Conservation Park through a combination of mustering, fencing and aerial culling.

Threat management programs undertaken by DBCA include a monitoring and evaluation program to ascertain the effectiveness of feral herbivore, weed and fire management. Monitoring of threatened and iconic small mammals across the Kimberley during the past six years has demonstrated a robust trend of increased mammal species abundance and stability, correlated with increased patchy early dry season burning and reduced impacts from feral herbivores. These results, together with the positive results from this survey, suggest the investment in fire and feral animal management strategies is now paying dividends for mammals, purple-crowned fairy-wrens and biodiversity in general within King Leopold Ranges Conservation Park and more broadly across the Kimberley.

LOOKING FORWARD

We are now transitioning into a new phase of management in the Kimberley. During the past few years, an unprecedented level of funding was invested for the creation of marine and terrestrial parks, making a real difference in protecting the region's incredible natural landscapes and diversity by managing the key threats of bushfires, introduced animals and weeds.

Ten Indigenous Land Use Agreements have been entered into in recent years, resulting in joint management with nine traditional owner groups over terrestrial and marine parks across the Kimberley region. This has resulted in direct employment and fee-for-service opportunities for traditional owner groups, managing and protecting their traditional country which holds great cultural and natural value. DBCA is now continuing to work with its joint management partners across the Kimberley to protect the area's precious biodiversity assets, including purple-crowned fairy-wrens, and to ensure the longevity of nature conservation initiatives and a better way for management into the future.

Johnny Divilli, a young Wilinggin man and DBCA employee reflects on his role in the surveys and what it means for his Country:

"It's really good to go out and see how many fairy-wrens are left on our Country. This helps us know they are safe, as they are important in looking after Country as part of our culture and lore. We really enjoyed walking the long distances looking for the fairy-wrens, we don't often do this anymore but it helps us reconnect and spend time on our land. By walking and spending time on Country, we see things we don't usually see when driving around all the time. The purple-crowned fairy-wren isn't a culturally significant species, but it was good to learn about it and how to look for it and why it is endangered. We can now work together to help protect it."

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