

Grant Acquittal Report – Automated Rehabilitation Climate Regulation Misting System

Project Name: Automated Rehabilitation Climate Regulation Misting System

Grant Provider: NWC Wildlife Rehabilitation Equipment and Enclosure Grant

Organisation: Koala Conservation Australia Limited

Date: 25 March 2025

Koala Conservation Australia has successfully implemented and completed the Automated Rehabilitation Climate Regulation Misting System project funded by the NWC Wildlife Rehabilitation Equipment and Enclosure Grant. The system is a computer controlled misting system which activates on multiple sensor readings (temperature, humidity) to switch on various misting zones providing targeted enclosure patient comfort as required. The project has exceeded our initial expectations in terms of functionality, efficiency, and positive impact on koala welfare in their rehabilitation enclosures at the Koala Hospital. This report details the project's implementation, outcomes, financial expenditure, and future potential, demonstrating the significant value this grant has provided to our rehabilitation facilities and the koalas in our care. Significantly reducing water wastage through targeted zone activation.

Project Implementation Overview:

The Automated Rehabilitation Climate Regulation Misting System has been fully implemented across two separate facilities, encompassing seven koala enclosures in total. This represents an expansion beyond our original scope of four enclosures as outlined in our grant application, achieved through careful resource allocation and efficient design. The computer-controlled system now provides comprehensive environmental management for our rehabilitation spaces, significantly enhancing our capacity to care for koalas during recovery, particularly during periods of extreme heat which are becoming increasingly common across our region.

Each enclosure is now equipped with customised misting capabilities that activate based on precise environmental parameters established in consultation with our veterinary team. The system incorporates WiFi-connected sensors that continuously monitor temperature and humidity levels, triggering automated responses when conditions fall outside optimal ranges for koala comfort and health. Specifically, the system activates when temperatures rise above 28°C for animal comfort or when humidity falls below 55% to preserve the quality of browse material. This automated approach ensures consistent environmental conditions regardless of staff availability or time of day.

The technical implementation includes a network of variably-sized misting nozzles ranging from 0.2mm to 0.8mm, selected based on specific location requirements within each enclosure. These deliver a fine mist that effectively cools the environment without oversaturating the space or creating excessive moisture. The system's intelligent programming includes a duty cycle that activates misting for one minute followed by a three-minute pause, efficiently managing water usage while maintaining optimal conditions.

Financial Acquittal:

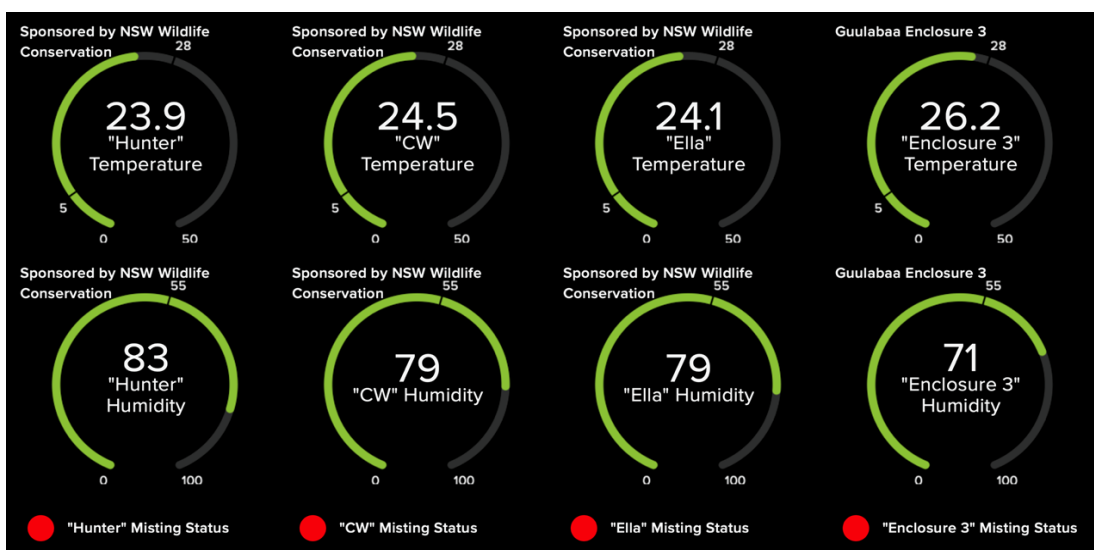
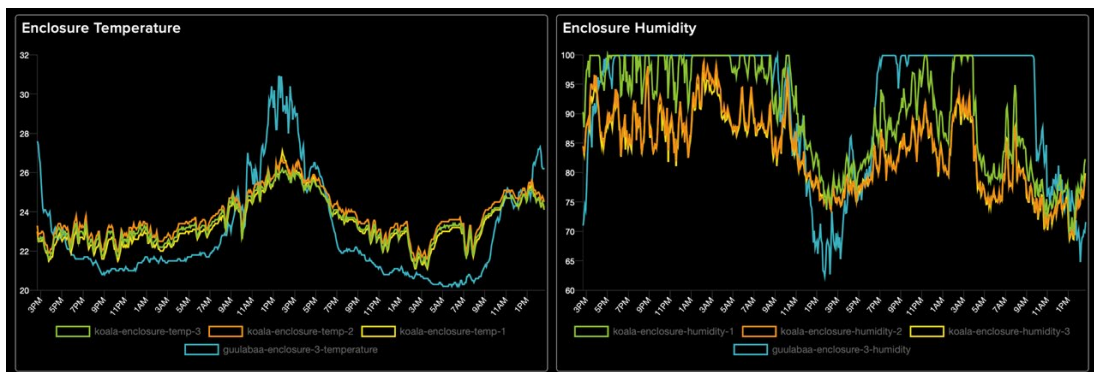
The NWC Wildlife Rehabilitation Equipment and Enclosure Grant provided funding of \$2,450 for this project, which we have utilised fully and efficiently (see Table 1). All expenditure aligns with the original budget submitted in our application, with funds allocated precisely as planned in our grant proposal. The complete financial breakdown is as follows:

The microprocessor, associated electronics, wiring, enclosures and consumables cost \$500 as budgeted, allowing us to implement the central control system for the misting network. Environmental monitoring sensors, including temperature and humidity probes critical for the automated activation system, were purchased within our \$250 allocation. Electronic water valves, essential for the zoned activation system, were sourced at \$500, exactly matching our budget projection. Plumbing and misting components, including various nozzle sizes ranging from 0.2mm to 0.8mm and connectors, totalled \$500 as anticipated in our original application. Electrical cabling, conduit and connection materials were acquired within our \$400 allocation, enabling secure installation throughout all enclosures. Sensor cabling and connection plugs amounted to \$300, completing the communication network for the environmental monitoring system.

Table 1 Financial Acquitall for NWC Grant: KCAs Automated Rehab Climate Regulation Misting System

Budget Item	Approved Amount
Microprocessor, electronics, etc.	\$500
Environmental monitoring sensors	\$250
Electronic water valves	\$500
Plumbing and misting parts	\$500
Electrical power cables, conduit	\$400
Sensor cabling and plugs	\$300
TOTAL	\$2,450

Figures 1 & 2: Real Time data received from the Automated Misting System, temperature and humidity per enclosure and an over view of temperature and humidity for all enclosures



Photos 1-4: Real Time data received from the Automated Misting System, showing log sensor and sprinkler system & CW enjoying the mist



All expenditure is supported by receipts and invoices maintained at our administrative office, with copies available upon request. The project was completed within the grant timeframe and has been fully operational since implementation.

Project Outcomes and Impact:

The implementation of the Automated Rehabilitation Climate Regulation Mistig System has transformed KCAs approach to environmental management within our koala rehabilitation facilities. Most significantly, the system has demonstrably improved koala welfare during rehabilitation, particularly during periods of elevated temperatures. We have observed marked behavioural improvements in our koalas, with noticeably reduced signs of heat stress such as excessive panting and lethargy even on days exceeding 35°C.

The system's intelligent humidity management has extended the freshness and nutritional value of eucalyptus browse, a critical component of koala rehabilitation. Prior to implementation, browse would often dry out rapidly during summer months, requiring more frequent replacement and creating additional workload for our volunteers. We now observe browse maintaining optimal moisture levels for approximately 30% longer, reducing waste and ensuring koalas have access to higher quality nutrition throughout their rehabilitation process.

Water conservation has been a significant additional benefit of the system. Through targeted zone activation based on actual environmental conditions in each enclosure, rather than facility-wide activation, water usage for cooling has been reduced by approximately 45% compared to our previous manual misting approach. This aligns perfectly with our organisational commitment to sustainable resource management while improving animal welfare outcomes.

The data logging capabilities have provided valuable insights into microclimate variations across our facilities, allowing us to identify specific enclosures that experience more extreme temperature fluctuations. This information is already informing future facility designs and modifications to existing structures to improve natural temperature regulation. Our veterinary team is particularly enthusiastic about correlating environmental data with recovery rates and medication responses, potentially informing more tailored treatment protocols.

System Sustainability and Future Potential:

One of the most significant achievements of this project is its long-term sustainability. The system has been designed with maintenance and longevity as key considerations. All components were selected for durability in outdoor conditions, with weather-resistant housings protecting electronic elements. We have established a pool of spare parts for specialised components to ensure prompt repairs if needed, while the majority of the system utilises locally sourced standard components that can be easily replaced.

Maintenance procedures have been documented in a comprehensive manual, and several volunteers have been trained in basic troubleshooting and system management. This approach ensures the system will continue functioning effectively for many years, representing exceptional value for the grant investment. The modular design also allows for future modifications and upgrades without requiring complete replacement.

Looking forward, the system has significant scope for expansion and additional functionality. Discussions are already underway regarding a solar/battery solution for remote rehabilitation locations without reliable mains power. This would extend the benefits of automated environmental

control to our satellite facilities and potentially to home-based carers managing koalas in the early stages of rehabilitation.

Additional potential enhancements identified include integration with fire detection systems for emergency response, motion detection for behavioural monitoring, automated water trough filling based on float levels, and portable wireless sensors for flexible environmental monitoring. These represent future opportunities to build upon the current system's success rather than limitations of the current implementation.

Conclusion and Acknowledgement:

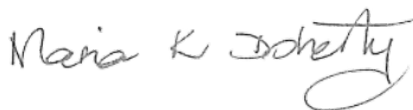
The Automated Rehabilitation Climate Regulation Misting System project has been a resounding success, meeting and exceeding all objectives outlined in our original grant application. The system is fully operational across seven enclosures at two facilities, providing automated, efficient environmental control that significantly enhances koala welfare during rehabilitation. The water-efficient design, data logging capabilities, and modular expansion potential represent valuable additional benefits beyond our initial project scope. KCA intends to further roll out this new system to all koala yards in the near future, having seen the beneficial impacts provided by the project.

We extend our sincere gratitude to the NWC Wildlife Rehabilitation Equipment and Enclosure Grant program for the funding that made this project possible. The investment has already demonstrated substantial returns in terms of improved animal welfare, operational efficiency, and resource conservation. The knowledge gained through this implementation will also benefit the broader wildlife rehabilitation community as we share our experiences and design insights with partner organisations.

With all project objectives achieved and funds fully expended in accordance with our application, we respectfully submit this acquittal report for review. Koala Conservation Australia remains committed to continuing innovation in rehabilitation practices, building upon the strong foundation this NWC Wildlife Rehabilitation Equipment and Enclosure Grant has helped establish.

On behalf of our organisation, our volunteers, and most importantly, the koalas benefiting from this system, thank you for your support of this important project.

Signed:



KCA General Manager, on behalf of the Koala Conservation Australia Team, 3/3/25