GOVERNMENT OF WESTERN AUSTRALIA

Department of **Biodiversity, Conservation and Attractions**

Biodiversity and **Conservation Science**

Program updates 2022

December 2022

Animal Science Program

Key achievements 2022

Translocations to support species recovery and fauna reconstruction

- Fauna reconstruction on Dirk Hartog Island has passed the halfway mark, with seven species translocated. In 2022, 50 Shark Bay mice, 60 greater sick-nest rats, 43 dibblers and 85 western grasswrens were released on the island, with innovative monitoring approaches trialled.
- In partnership with the South Coast Region, a trial translocation of eight Gilbert's potoroos from Bald Island and Waychinicup enclosure to Two Peoples Bay was completed as a first step to restoring the population at this site following an intense wildfire in 2015.
- Seven western ground parrots were translocated from Cape Arid National Park to Waychinicup National Park in partnership with South Coast Region. This was the second wild-to-wild translocation.
- Final monitoring of mammals and birds translocated from Barrow Island to the Montebello Island group was completed, with evidence of widespread dispersal on the islands.

Informing feral cat management

- Testing the susceptibility of golden bandicoots to the Eradicat® feral cat bait inside the Matuwa enclosure was undertaken, demonstrating low risk to the species.
- Susceptibility of red-tailed phascogales to Eradicat® was tested over four trials within Tutanning Nature Reserve (Western Shield, Wheatbelt Region), with early results indicating minimal impact.
- Preliminary results of Felixer® feral cat grooming trap trials in the southern jarrah forest indicated that they are likely to be an effective complementary approach to controlling feral cats at a meso-spatial scale.
- Trials have commenced in the northern jarrah forest to investigate feral cat movement patterns to inform more targeted control (CEM, DPIRD).

Science underpinning species recovery

- A revised region-wide monitoring program for Pilbara northern quolls has been established, based on vertically orientated remote sensing cameras.
- A review of progress against the Pilbara northern quoll research program has been submitted for publication, with outcomes that will help inform on-ground management actions.
- A review of bilby related research in the Pilbara and a synthesis of information on all the MNES species to inform the development of a strategy for offset investment has commenced (funded by DWER).
- Continued to develop high-throughput SNP genotyping methods for more rapid, cost-effective and reproducible screening of faecal DNA samples (including sex-linked markers) for a number of species.
- Landscape genetic analyses (ARC Linkage) have been completed for multiple small mammal species in the Pilbara that spatially depict landscape connectivity, genetic diversity and turnover, and habitat suitability, with publications on northern quoll and Pilbara leaf-nosed bat. New ARC proposal submitted to expand to reptiles.
- Final report on the NESP NAER Hub bilby project in the Fitzroy Crossing approved and released.
- Reviews of science supporting Gilbert's potoroo and dibbler recovery have been completed; numbat report under review.
- Pilbara olive python project has commenced to track pythons and to establish models to investigate impacts of predation on juveniles.
- Improved monitoring approaches for numbat, western ringtail possum and chuditch have resulted in robust density estimates and will better enable assessments of management effectiveness.
- Commenced new project to investigate innovative tools to inform fire management for the noisy scrub bird in collaboration across several BCS programs and South Coast Region.

Biodiversity Information Office (BIO)

Key achievements for 2022

System implementation

- Delivered the first release of the Dandjoo biodiversity data sharing platform.
- Established a feed of data from Dandjoo to the Commonwealth's new national Biodiversity Data Repository.
- Delivered the Nomos taxonomic names management platform.
- Launched the BIO website and Knowledge Base.
- Developed and implemented core internal business tools, including the first iterations of BIO's data curation pipeline, documentation wiki, and data reporting dashboard.

Data sourcing and curation

- Ingested approximately 1.2 million curated species occurrence records into Dandjoo.
- Back-populated Nomos with approximately 60,000 taxonomic names.
- Sourced previously unreleased datasets from BHP, Fortescue Metals Group, and Rio Tinto for ingestion into Dandjoo.

Innovation

- Designed, built, and launched Australia's first template-free data submission portal for species occurrence data.
- Developed a new global best practice approach that will allow Dandjoo to provide reduced-precision species occurrence data securely to the public in 2023; the new approach was validated at a novel hackathon-style event, where volunteers from a number of business units, agencies, and other organisations worked together to identify vulnerabilities.

Collaboration and user engagement

- Consulted with current and potential Dandjoo and Nomos users to develop a detailed program of enhancements and new features for implementation in 2022-23 and 2023-24.
- Worked with Western Australian Museum and Species and Communities Program staff to streamline sharing of taxonomic names data between the Museum and DBCA.
- Coordinated BCS's decommissioning process for the legacy NatureMap platform, working with other business units to capture and document priority features for implementation in Dandjoo.

Showcasing DBCA's commitment to open-source development

- Presented Dandjoo as a case study at the Office of the Information Commissioner's International Access to Information Day seminar.

Ecosystem Science Program

Key achievements for 2022

Research to inform management of wetlands

- Commenced a project examining the role of shallow groundwater in maintaining the threatened Lake Clifton thrombolites, in collaboration with UWA, DWER and PHCC.
- Analysed the utility of new salinity mapping in the Wheatbelt for assessing threat to flora.
- Undertook geophysics survey to better understand sources of groundwater supplying selected Leeuwin-Naturalist caves.
- Reviewed hydrological data from the Walyarta organic mound springs to understand if stream flow connects and provides water to springs following cyclonic rainfall.
- Continued to update and assess the Toolibin Lake water balance model.
- Completed a hydrogeochemical and geophysical survey of Brixton Street wetlands to identify salinisation and potential acidification, in collaboration with CSIRO.

Biodiversity survey to provide insights for land management planning

- Collated and aligned Swan Coastal Plan datasets for analyses of floristic communities.
- Sampled invertebrates during a DBCA and traditional owner visit to Dragon Tree Soak.
- Undertook a flora survey to inform gravel extraction within Karijini National Park.
- Completed identifications and data compiling for a global study of gypsophilous plants.
- Analysed invertebrate data for Goldfields wetlands sampled in 2014 and 2017.

Research to inform forest management

- Published a paper on results of two rounds of Forestcheck monitoring.
- Developed height-diameter relationships in jarrah and marri regrowth for the next FMP.
- Investigated the population dynamics of *Banksia grandis* and investigated the potential impacts of harvesting on fruit production.
- Extended research into decline in forest vegetation cover to examine 30-year patterns.
- Commenced investigating ecological responses to ecological thinning, including fuel loads, fuel hazard, soil compaction, and understorey floristics.
- Analysed microbial sequence data looking at the effects of forest thinning on soil health.
- Undertook a study that demonstrated that geophysics mapped shallow soils (less than 12m thick) and these corresponded with severely drought affects sections of jarrah forest.

Understanding landscape scale genetics to inform restoration and rehabilitation

- Published three papers documenting phylogeographic patterns of five widespread plant species across the Pilbara bioregion that will inform mine site rehabilitation.

Monitoring to understand ecological change and management effectiveness

- Continued sampling biotic and environmental indicators of condition in Ramsar wetlands.
- Analysed data from the former SWMMP project to understand salinisation versus climate as a driver of changing salinity in Wheatbelt wetlands.
- Sampled soil across Forestcheck sites to investigate utility of eDNA for detecting ground-dwelling vertebrates and commenced building a vertebrate reference library.
- Undertook metabarcoding analyses of zooplankton to examine impacts of redclaw crayfish.

Fire Science Program

Key achievements for 2022

Standardised approach to fire science mapping and reporting

- Implemented a departmental standard approach to fire severity mapping and reporting in partnership with FMS and Regional Fire Management. Work has begun on applying this approach to the Landsat record in the Swan Region to develop a detailed fire regime history. This has introduced a new dimension to fire severity reporting and analysis, significantly improving documentation and mapping of complex burn boundaries and unburned patches.

Fire Research and monitoring

- Undertook a reconstruction and analysis of the Calgardup fire that burned karri forest, limestone heaths and peppermint woodlands in the Leeuwin-Naturaliste National Park in December 2021, including fuel attributes and fire dynamics.
- Commenced a long-term 'soft edge mosaic' project in two large blocks in southern Jarrah forests in the SW region, examining consequences of applying of frequent ignitions under mild fire conditions on fuel, fire, habitat attributes, and sensitive species. A camera trap network was established to compare mammal responses to this treatment versus regular, cell-based prescribed burning.
- Experimental fires and associated monitoring were implemented in jarrah forest and banksia woodland ecosystems, continuing long-term research projects of fire regime effects on forest understorey, and urban fire and weed management interactions respectively.
- Post fire survey and monitoring of ecosystem responses continued in the Kimberley savannah, banksia woodlands and jarrah forest ecosystems studying the effects of varying fire severity, season, intervals, and patterns.
- Commenced testing the utility of portable doppler radar for assessing smoke plumes and air movements in prescribed burns in the SW in collaboration with Monash University, Bureau of Meteorology and others.
- BCS and Warren Region were successful in two external funding submissions to support research on fire operations and management interactions with climate change risk in relation to peat ecosystem mapping and conservation (with UWA and ECU; five year term), and freshwater aquatic fauna communities and fire waterpoints (Murdoch, three year term), commencing in late 2022.

Research Outputs

- Published papers on a global meta-analysis of fire season effects on plant population recovery; a national assessment of fire-related threats and transformational change resulting from the Black Summer bushfires; a model of risk to plant populations from short fire intervals across the SW; and an analysis of time-since-fire effects on banksia woodlands bird species.
- Analyses of fuel dynamics in relation to time since fire for banksia woodlands and karri forest were published and completed (manuscript submitted for review) respectively.
- One PhD student (Sydney Collett – Charles Darwin University), and one Honours student (Farnaz Mousavi – Notre Dame) completed their studies on Gouldian finch habitat and resource responses to fire regimes, and weed cover effects on post-fire seedling establishment of native species in banksia woodlands respectively.

Kings Park Science Program

Key achievements for 2022

Restoration Science

- Completed the four-year translocation research project with MRL that increased our understanding of translocation potential of *Tetratheca erubescens*. Knowledge transfer was subsequently undertaken with the Goldfields region.
- Commenced a significant four-year collaboration with RIO to examine the ecophysiology and pollination systems of the rare *Aluta quadrata* in the Pilbara (Western Ranges).
- Extended the collaboration with DPIRD for another three years to understand opportunities to improve desirable native grass components in Kimberley grazing systems.
- Contributed to multiple horticultural and restoration projects in Saudi Arabia, all aiming to increase plant cover across the kingdom.

Rare Species

- Commenced a high-profile national program in partnership with the Australian Seed Bank Program and WWF to undertake translocations and improve ex-situ conservation of rare orchids including *Caladenia busselliana*. Promotion being undertaken by Woolworths through Botanica Airwick products.
- Implemented three rare species translocation programs including the first translocations of rare orchids (Carbunup King and Bussell's Spider Orchid) into the Botanic Garden to improve public engagement with rare species and increase visibility of our orchid program.
- Maintained 47 species in the rare species tissue culture collection, supported by 44 species in cryopreservation.
- Commenced three-year ARC grant in collaboration with Curtin University, Royal Botanic Gardens Sydney, ANPC and Native Plants Queensland exploring cryogenic innovations to help fight the myrtle rust pandemic.

Conservation Genetics

- Building on the release of the blue kangaroo paw by BGPA, commenced a three-year ARC linkage project with ECU, UQ, UWA and European colleagues to unlock the genetic and biochemical potential of kangaroo paws.
- Commenced a nationally collaborative project through CRC TiME exploring evidence for effectiveness of climate-adapted seed sourcing strategies for revegetation success in a changing climate. This is leveraged from the ongoing multi-year study assessing seed sourcing strategies for ecological restoration under current and future climates across the Swan Coastal Plain.

Seed Science

- Commenced a collaborative 3.5-year project facilitated through CRC TiME focusing on Scaling seed-based restoration solutions for the Australian resource sector.
- Commenced a five-year collaboration with the Max Planck Queensland Centre on materials science of extracellular matrices to examine mechanisms controlling banksia seed protection and follicle opening.
- Contributed to the planning and implementation of a Kings Park Kimberley seed collecting trip that established ex situ collections of species at risk of myrtle rust and sourced seeds for an on-going ARC linkage project studying seed longevity.
- Patent applications filed in Australia and the United States for two novel mechanical seeding devices. Commercialisation of seed flaming being realised with large commercial orders now being placed.

Marine Science Program

Key achievements for 2022

Scientific recognition

- The North West Shelf Flatback Turtle Program (NWSFTCP) received the President's Award for its contribution to sea turtle conservation at the recently-held 40th Annual International Sea Turtle Symposium. The team continue to monitor beaches at Delambre Island, Thevenard Island and Eco beach. These annual programs reliant on the participation of more than 60 volunteers and key collaborations with Yawruru and Ngarluma Aboriginal Corporations.

Scientific and technical advice

- Marine Science is co-leading a WAMSI Westport projects on seagrass communities as well as the abundance, range patterns and diet of the endangered Australian sea lion in Perth metropolitan waters. The sea lion project has included significant collaboration and support from DBCA, with participation of over 35 DBCA staff including representatives from BCS, RFMS and CEM. Early results from tagging animals on Seal and Carnac islands indicate sea lions are travelling as far north as Jurien Bay, south to Cape Naturaliste, and west to Rottnest Island.
- Collaborated with JTSI on a successful project proposal in support of the United Nations (UN) Decade for Ocean Science. The project titled 'Integrating ecological, social and cultural values of WA's coastal waters: the case of Yawuru Nagulagun (Roebuck Bay)' will receive $800,000 over four years and is led by Murdoch University with support from DBCA.
- Undertook field programs in the North Kimberley, Lalang gaddam, Yawuru Nagulagun Roebuck Bay, Montebello and Barrow Islands Ningaloo, Shark Bay, Jurien Bay, Ngari Capes, Marmion and Shoalwater marine parks to provide updates on the condition of fish, coral, seagrass and invertebrate communities, while maintaining datasets on seawater temperature across reserves.
- Contributed to the annual marine park performance assessment process, providing information and advice to justify ecological condition assessments, and presenting detailed monitoring information on the North Kimberley, Yawuru Nagulagun Roebuck Bay and Eighty Mile Beach marine parks at the workshop.

Monitoring

- Collaborated in a research project to improve the cost-effectiveness of long-term monitoring of dugong and address key knowledge gaps about the spatial and temporal changes in dugong distribution, abundance, connectivity and population health at large spatial scales. Aerial surveys will be conducted at Shark Bay Marine Park, Ningaloo Marine Park and Exmouth Gulf and will support the development of Indigenous-led monitoring.
- Began trialling a marine monitoring dashboard that will allow online users to visualise ecological indicators over specified times and zones within each park.
- Continued to provide high level internal and external advice on issues related to development assessments, DBCA permits and marine parks.

Perth Zoo Science Program

Key achievements for 2022

Captive breeding of threatened native species

- Three numbats were released to Secret Rocks in South Australia in June. A further 11 numbats were released into Mallee Cliffs National Park in New South Wales in December 2022. This followed a successful breeding season with a total of 11 young produced.
- A total of 71 western swamp tortoise hatchlings were produced in the breeding colony in 2022 and 68 survived. A record number of tortoises were released with 147 released to Moore River National Park and 44 released to Scott National Park.
- Forty-four dibblers bred were released to Dirk Hartog Island National Park in October and November. The Minister for the Environment, the Hon. Reece Whitby MLA, attended the release on 15 October. This brings the Perth Zoo Science breeding program to a total of 1074 dibblers produced.
- The 2022 release of *Anstisia* (formerly *Geocrinia*) frogs took place in September, with 124 *A. alba* (consisting of 94 head-started juveniles and 28 captive-bred) and 72 *A. vitellina* (consisting of 24 head-started juveniles and 24 captive-bred) released to sites near Margaret River.
- Field trips to collect clutches of *Anstisia* frogs from the wild for releases in 2023 took place in October and November 2022, resulting in nine clutches of *A. alba* and 5 clutches of *A. vitellina* being collected. In addition, adult frogs in the captive breeding colony produced 12 *A. alba* metamorphs.

Other Conservation Outcomes

- Hairy marron continued to be held in small numbers at Perth Zoo with careful monitoring of health and water quality to increase our understanding of the biology of this species. Reproductive behaviours were recorded, and one female currently has eggs, which is the first breeding of this species within Perth Zoo.
- Black cockatoo monitoring continued in 2022, with 10 forest red-tailed black cockatoos rehabilitated at the Kaarakin Black Cockatoo Conservation Centre banded and released at Bedfordale in April; seven Carnaby's cockatoos rehabilitated at the Kaarakin Black Cockatoo Conservation Centre and released at Bridgetown in May; and 14 rehabilitated forest red-tailed black cockatoos released at Drakes Brook near Waroona in June. Seven Carnaby's cockatoos rehabilitated at Native Animal Rescue in Malaga were also banded and released at Yanchep National Park in June.

Other Research Activities

- Perth Zoo Science continued to support research projects involving native and exotic species such as social dynamics of captive capuchins; behavioural audiograms of little penguins; testing the effectiveness of Covid-19 vaccinations on zoo animals; and validation of using iDNA from invertebrates for monitoring vertebrates.

Plant Science and Herbarium Program

Key achievements for 2022

The Western Australian Herbarium and Western Australian Seed Centre, Kensington

- The Herbarium continued to provide taxonomic and location information on WA's flora to underpin conservation and development planning decisions.
- A total of 9,452 specimens were added to the Herbarium collection and 60,158 specimen records were edited as part of names curation and data cleaning in preparation for migration to the Specify Collections Management System. More than 7,400 images of specimens were captured, primarily of conservation-listed Pilbara taxa. In total, 677 names were added to the WA Plant Census, 362 name changes were processed to align with accepted taxonomic research, and there were 541 data updates to records.
- The Herbarium received the significant donation (approximately 5,000 specimens) of the private collection of the late Allen Lowrie, a carnivorous plant expert.
- The Herbarium journal *Nuytsia* published 16 papers, with a further four in preparation. New species have been described in *Stylidium*, *Drummondita*, *Austrostipa*, *Exocarpos*, *Balaustion*, *Hypocalymma*, *Eriochilus*, *Calytrix,* as well as various epacrids.
- Recently-retired research scientist Barbara Rye received the Australasian Systematic Botany Society's Nancy T. Burbidge Medal, recognising her longstanding and significant contribution to systematic botany.
- Botanists participated in the Charnley River/Wilinggin IPA/Wunaamin Conservation Park Bush Blitz in the Kimberley, collecting ~400 flora voucher specimens for addition to the Herbarium collections.
- The Herbarium has reduced the use of single use plastics by incorporating reusable boxes in the Reference Herbarium's freeze rotation, contributing to the WA Government's 'Plan for Plastics' program.
- The Western Australian Seed Centre, Kensington incorporated 67 seed collections of 27 threatened and nine priority species, primarily from species impacted by fire in the Stirling Ranges (emergency seed collecting fund to save Australian native flora) or identified as a priority for conservation in the Australian Government's Threatened Species Strategy (Safeguarding Midwest Flora Project).

Molecular-based taxonomic, genetics and ecological research supporting flora conservation

- Research and recovery actions continued after 2018 and 2019 bushfires in the Stirling Range National Park in conjunction with South Coast region, including installation of fencing to exclude herbivores and the monitoring of survival of translocated seedlings in seed production areas. Produced journal publications synthesizing national impacts of the 2019-20 wildfires on ecological communities and plant species recovery; and development of a germination protocol for the previously difficult to propagate Critically Endangered *Persoonia micranthera* through experimentation using related non-threatened *Persoonia*.
- Program staff, as part of the wildlife and habitat bushfire recovery partnership (a large consortium including other BCS programs, DBCA Regional staff, other government agencies, NGOs, and university researchers), were awarded the Ecological Society of Australia 2022 Ecological Impact Award.
- Staff finalised a *Leptospermum* project as part of the CRC for Honey Bee Products, resolving taxonomic issues within the genus using a phylogenetic approach and resulting in the description of four new plant genera (two of which are endemic to WA) and clarification of the Western Australian species within them.
- Collected DNA samples to clarify the taxonomic status of the Critically Endangered *Eucalyptus leprophloia*, regarded as a hybrid taxon by some authorities, in collaboration with Midwest Region.
- Reintroduction and seed production area translocations, and new seed collections, were conducted for the Critically Endangered *Grevillea calliantha* in collaboration with Midwest Region and the Northern Agriculture Catchments Council.
- Published a review of the Threatened and Priority flora of the Southwest Australian Floristic Region, documenting spatial patterns and tenure of occurrence, listing criteria and distribution across lineages.

Remote Sensing and Spatial Analysis Program

Key achievements for 2022

R package for oxygenation plant metrics

- Developed a new R package providing a way to process and quality assess raw sonde data collected from around the oxygenation sparges on the Swan and Canning rivers. Profile plots of these metrics enable the Rivers and Estuaries branch to visualise the effectiveness of the settings of the plants.

Spatial analysis to support cane toad aversion training

- Developed a habitat suitability model for the floodplain goanna *Varanus panoptes* with Ecosystem Health Branch to prioritise areas for cane toad taste aversion training using live baits. A web map has been produced to effectively communicate the model with Country managers and facilitate on-ground works.

Development and operationalisation of remote sensing based technologies for fire management

- Provided training to staff in the South West Region in the ordering and use of airborne thermal imagery for burn security application, providing information on where hotspots in the burn are located and improving management of the burn perimeter.
- Completed a comprehensive update the fire history information across the entirety of the Great Western Woodlands for the period of 2011 to August 2022 by Landsat image analysis, and subsequently developed workflows, spatial metrics and pilot analyses to support planning of fire mitigation activities and assessment of locations vulnerable to fire regime change.
- Burn severity model developed from field measures and satellite imagery in the southwest forests was implemented for autumn 2022 burning and is currently being applied to historical fires to provide a basis for analysis of burn history.

Spatial multi criteria analysis of wetland ecological value

- Building on the multi criteria analysis completed for the Swan Coastal Plain in 2020 and the Moora West Dandaragan in 2021, criteria were identified relating to the ecological value of wetlands of the southwest area and spatial modelling was undertaken to represent and combine these criteria to create a scaled map of ecological values. As part of a collaborative project with the Department of Water and Environmental Regulation this analysis will provide supporting information in decision making regarding the conservation and management of wetlands across government.

Indigenous engagement and drone surveys

- Undertook a field trip on the Fortescue Marsh with the Pilbara Region and Karlka Nyiyaparli community members to establish on ground and close-range remote sensing methods using drones for monitoring changes to vegetation condition. The methods developed will provide quantitative measures of changes to vegetation cover and condition due to planned cattle exclusion.

Mangrove monitoring in the Kimberley

- Mangrove monitoring methods for the south Kimberly were developed based on drone imagery and Sentinel-2 satellite data, providing mangrove density and extent measures at 10m resolution for the last six years. Also, long term (30+ years) mangrove monitoring utilising 30m Landsat imagery was produced for marine park management reporting across the Kimberley marine parks utilising groveR, a purpose-built R package.

Rivers and Estuaries Science Program

Key achievements for 2022

Waterway Health: monitoring and reporting on water quality and ecological health

- Trained four new recruits and one indigenous ranger cadet in water monitoring.
- Over 5000 samples collected annually from estuary and catchment.
- Improved availability of water information enabling better access to long-term datasets.
- Online reporting dashboard at phase one development stage.
- Released report on fish communities in the Swan Canning Riverpark.
- Compiled five years of data on seagrass performance with public presentations of research during National Science Week.
- Reviewed oxygenation monitoring to improve efficiencies and reported on targets.
- Finalised report on contamination in sediments.

Waterway investigations: understanding and mitigating threats to Swan Canning

- Released report on per- and poly-fluoroalkyl substance (PFAS) contamination.
- Supported implementation of WA Government's 'Plan for Plastics' initiative through media and report to stakeholders on plastics contamination in the Swan Canning estuary.
- Supported the 'Plastic Free Riverpark' initiative by establishing a collaborative project investigating plastic contamination in key drainages.
- Finalised report on contamination in western school prawns.
- Progressed the evaluation of phytoplankton biovolume.
- Progressed trials to control *Alexandrium* with Murdoch University, DPIRD and DoH.
- Collaborated in two ARC grant submissions.

Tools and technologies: developing decision support tools; trialling new technologies

- Established a new estuarine model domain and boundary conditions to support Swan oxygenation evaluation.
- Compilation of available datasets to support hydrological and land use-specific nutrient export modelling for Ellen Brook.
- Juvenile bull sharks tagged and the acoustic array updated for tracking.

Ecosystem understandings: better knowledge of waterway function and biodiversity

- Completed benthic image analyses for habitat map creation.
- Investigated factors influencing macrophyte presence in Kent St Weir pool.

Habitat enhancement: understanding habitat and how to improve and protect it

- Established living seawall trial in lower Swan in collaboration with riverbank managers.
- Supported progress to construction of Swan River mussel reef.

Management support, advice and incident response

- Evaluation of contaminant and water quality issues associated with planning and installation of five metropolitan bridges.
- Supported planning for Canning Waterways Restoration Plan – engaged NESP project.

Species and Communities Program

Key achievements for 2022

Biodiversity information

- Developed a streamlined database to combine flora, fauna and TEC data that will feed into Dandjoo.
- The team conducted 1158 searches to support NatureMap during transition to the BIO platform.
- Approximately 2900 observation records for conservation-listed species were curated (~2700 flora and ~ 200 fauna). Mapped and databased 309 TEC occurrences.
- A review of priority flora in the Pilbara has resulted in review of the conservation status of eight species.

Wetlands

- Investigation of wetland values resulted in amendments to the Geomorphic Wetland dataset at six sites.
- A Wetland Evaluation Swan Coastal Plain dataset prepared for release, and progress has been made on the wetland evaluation methodology for the south west and Moora West Dandaragan.
- Undertook site assessments and reviewed management of all twelve Ramsar sites in WA and commenced the development of a framework for Ramsar sites and reporting.
- Contributed to scientific assessment of bird monitoring at Lake Warden and Lake Gore, aquatic invertebrate and water quality assessments at Peel Yalgorup, and investigated thrombolites and hydrology at Lake Clifton.

Statutory listing process for threatened species and ecological communities

- The first listing of a threatened species under BC Act was made. Two meetings of the TECSC resulted in assessment of 65 communities against IUCN criteria for recommendation to the Minister.
- Approximately 51 IUCN assessments for threatened species have been undertaken this year, with 30 in preparation for consultation ahead of the next TSSC meeting.

Scientific and technical advice

- Provided advice on 175 referrals from DWER, DMIRS and planning processes to ensure protection and management of threatened species, communities and wetlands. Issued 133 flora and 287 fauna section 40 authorisations for licenced activities and management operations.
- Corporate Guideline 37 Risk Assessment for threatened species and communities was approved, delivering on a key commitment to Streamline WA and providing a framework to assess risks to conservation of threatened species and ecological communities in a consistent and transparent manner.
- Enhanced collaboration with government agencies supported Streamline WA initiatives, and engagement within DBCA is improving a consistent approach.
- Contributed specialist technical and scientific advice to Regional Conservation Planning Programs being developed by each region to inform on-ground conservation activities.
- Visited Wheatbelt with EMB to collaborate and exchange understanding of impacts to threatened species and ecological communities. Assisted Swan Region to undertake assessment of TEC's at Keane Anstey Damplands, providing staff an understanding of assessing TEC status of vegetation in the field.
- Staff contributed to collection of fauna for translocations and long-term monitoring of black cockatoo roost sites at Coomallo Creek.
- Held an expert and stakeholder workshop to support recovery of the critically endangered hairy marron and established a Captive Breeding Program Working Group that meets fortnightly to monitor and determine the best approach to the current breeding season.
- Developed new *Methods for Survey and Identification of Western Australian Threatened Ecological Communities* to outline the survey and identification requirements for TECs.