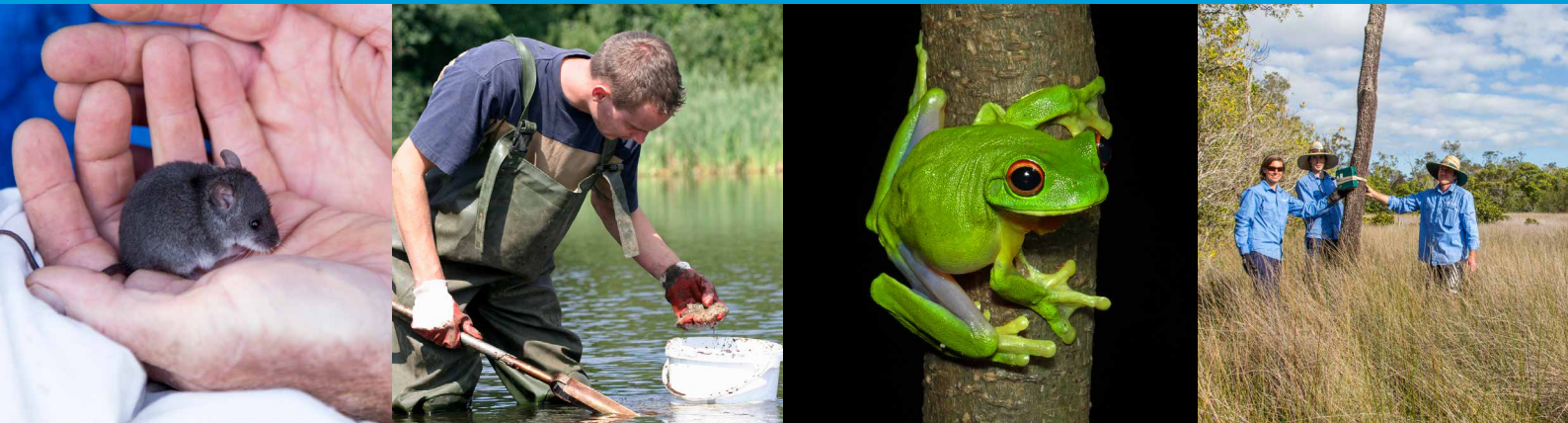




FPE provides an extensive range of **ecological services** for managing, conserving and enhancing biodiversity, land and waterways.



WE SPECIALISE IN THE PROVISION OF THE FOLLOWING SERVICES

Design, Planning and Management

- + Planning and environmental approvals:
 - + Detailed desktop assessments
 - + EPBC significance of impact assessments
 - + Ecological assessments and planning code responses
- + Management plans:
 - + Rehabilitation plans & Offsets
 - + Flora and fauna management plans
 - + Species management programs
 - + Weed and pest animal management plans
 - + Fire and bushfire hazard management plans.

Fauna Monitoring, Surveying and Assessments

- + Baseline fauna survey utilising a range of trapping, diurnal and nocturnal search techniques
- + Acoustic monitoring (birds, bats, frogs and more)
- + Motion-sensing hyperfire camera monitoring
- + Targeted threatened species survey techniques for amphibian, mammals, reptiles and birds
- + Pest animal monitoring and management
- + Fauna habitat design, creation and enhancement.

Flora Survey, Monitoring and Assessment

- + Regional ecosystem, TEC and marine plant identification and mapping
- + Threatened flora identification and population monitoring
- + Protected plant surveys (*Flora Survey Guidelines – Protected Plants*)
- + BioCondition monitoring (*Eyre et al 2015 methodology*)
- + Bush, dune, riparian and estuary regeneration
- + Invasive plant and weed survey and assessments.

Fauna Spotter-Catcher Services

- + Pre-construction and clearance fauna habitat assessments
- + Implementation of fauna management plans and advice
- + Clearing supervision
- + Aquatic salvage operations
- + Capture and relocation of fauna
- + Activity and wildlife record reporting.

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KEY PROJECTS



Environmental Levy Program Baseline Inventory Fauna Surveys

FPE has worked with Council on a number of projects to undertake preliminary inventory assessments of terrestrial mammals (including bats), reptiles and amphibians within a range of environmental reserves across the Sunshine Coast such as Mount Ninderry Environmental Reserve, Glasshouse Mountains Environmental Reserve, Lower Eudlo Creek Environmental Reserves, Tuan Environmental Reserve, Bells Creek Riparian Reserve, and more. The purpose of the ecological assessments is to develop baseline inventory data on species occurrence and relative distribution, with a focus on targeting possible threatened species. Our team integrates a suite of complex monitoring techniques to effectively assess and report on fauna species including:

- + Diurnal opportunistic sights and active searching
- + Small mammal trapping using Elliot and wire cage traps
- + Funnel and pitfall trapping combinations along drift fences
- + Camera monitoring using motion sensing hyperfire cameras
- + Harp trapping along potential microbat flyways
- + Acoustic monitoring for bats using song meters
- + Nocturnal spotlighting and aural survey techniques
- + Targeted threatened and cryptic species applications.



Acid Frog and Eastern Ground Parrot Monitoring Project

FPE is fulfilling ecological specialist roles for a long term monitoring project for three species of threatened acid frog (Wallum Sedgefrog, Wallum Rocketfrog and Wallum Froglet) and the Vulnerable Eastern Ground Parrot's in accordance with the EPBC Act approval requirements and respective Species Management Programs as part of an airport expansion project. Monitoring requires regular surveying of these species using targeted methodology, vegetation assessment, surface and groundwater monitoring and pest animal/predator monitoring. Key ecological survey methodologies for this particular project include:

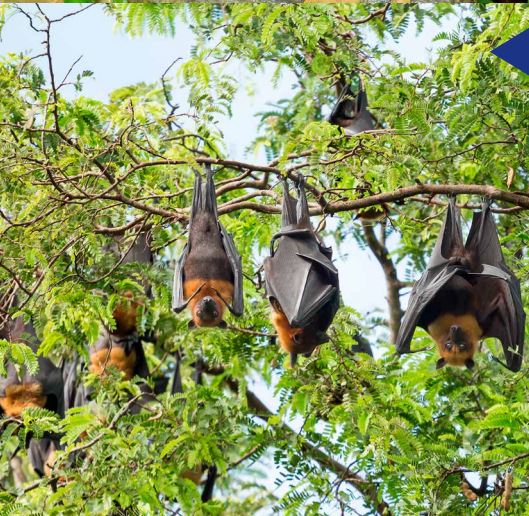
- + Acid frog recruitment surveys in retained habitat (dipnetting for tadpoles)
- + Repeated adult and recruitment surveys and water monitoring at a reference/control site (Mooloolah River National Park) for comparison to site conditions
- + Call count, call triangulation and flush surveys conducted outside the Eastern Ground Parrot breeding season
- + Acoustic monitoring of ground parrot calls utilising bio acoustic recorders (BAR) and visual analysis of ground parrot calls year round
- + Pest animal monitoring using black flash covert cameras
- + Vegetation assessments utilising numerous 1mx1m quadrats across all known habitats.



Cooroy to Curra, Section A, Bruce Highway Upgrade Project

FPE designed, implemented and maintained a rigorous monitoring program of three natural creek systems that crossed the road alignment pre, during and post construction, which included fourteen insitu water quality logging stations, aquatic health surveys, fish passage surveys and aquatic salvage activities. Additionally an extensive frog monitoring program for *Mixophyes iteratus* (Giant Barred Frog) in accordance with the EPBC Act approval was conducted. A summary of the services we provided for this project is outlined below:

- + Monitoring trends in aquatic health utilising AusRIVAS methodology through stream habitat baseline surveys, regular macro invertebrate sampling and monitoring of physical water quality parameters
- + Targeted nocturnal surveys for Giant Barred Frogs across numerous transect locations
- + Fish passage assessments utilising fyke netting to inform waterway barrier works approvals
- + Fauna Spotter-Catcher supervision and management during construction activities including pre-clearance habitat assessments, aquatic salvage during dewatering and more.



Stanley River and Kilcoy Bridge Upgrade Projects

FPE works extensively on a variety of road upgrade projects across Queensland providing a suite of environmental consulting services. Recently FPE have provided scoping, advice and threatened species management with relation to two bridge replacement projects, Stanley River Bridge (Peachester Road) and Kilcoy Creek Bridge (D'Aguilar Highway), in order to protect ecological values during construction. Both of these projects were identified as high risk areas for protected plants under the *Nature Conservation Act* and had known populations of fauna threatened species including the Giant Barred Frog (*Mixophyes iteratus*), Cascade Tree Frog (*Litoria personiana*) and colonial breeding Grey-headed (*Pteropus poliocephalus*) and Black (*Pteropus alecto*) flying-foxes. A summary of the services provided for these projects include:

- + Detailed desktop assessments to identify potential environmental values
- + Ecological site assessments inclusive of diurnal and nocturnal surveys targeting threatened species, active or potential animal breeding places and other site environmental considerations (soils, water etc.)
- + Protected Plant Surveys and reports in accordance with the *Flora Survey Guidelines – Protected Plants*
- + Species Management Programs for species listed as EVNT under the *Nature Conservation Act 1992* and Significant of Impact Assessments for species listed under the EPBC Act 1999
- + Obtainment of relevant environmental approvals and permits
- + Fauna spotter-catching, weed management and site rehabilitation services.

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FPE provides all aspects of **environmental restoration** services to private landowners, conservation organisations and local, state and federal agencies.



WE SPECIALISE IN THE PROVISION OF THE FOLLOWING SERVICES

Management and Plans

- + Contract administration
- + Specialist and technical advice
- + Rehabilitation and ecological restoration plans
- + Landscape and offset management plans
- + Weed and pest animal management plans
- + Ecological burn/bushfire hazard assessment and management plans.
- + Invasive species management plans

Planning and Offsets

- + Identification of offset liabilities under relevant local, state and commonwealth legislation
- + Identification of options for meeting offset liabilities, including site selection and methodologies
- + Documentation of offset requirements:
 - + Offset calculations
 - + Identification of environmental values
 - + Preparation of management plans
- + Undertake offset activities including:
 - + Assistance with acquisition of offset properties
 - + Offset plantings and/or revegetation
 - + Habitat creation/restoration.

Vegetation and Fauna Habitat Restoration and Rehabilitation

- + Ecosystem translocation
- + Bush, dune, riparian and estuary regeneration
- + Native flora plantings, watering and maintenance
- + Weed control and pest animal monitoring
- + Fauna habitat creation e.g. compensatory threatened frog ponds
- + Nest habitat (boxes, platforms etc.) design, installation, monitoring and maintenance
- + Ecological burn planning and implementation.

Green Development Solutions

- + Designing and implementing environmental initiatives
- + Development planning to retain or enhance existing ecological/environmental values
- + Native plant (local providence) landscaping
- + BioBasin and stormwater design plans, creation and compliance
- + Waste reduction and management strategies
- + Hydromulching, live topsoil transfer & hydroseeding

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KEY PROJECTS



Mount Emu She-oak Translocation Project

FPE are the principal contractors implementing the Translocation Management Plan for a population of Endangered Mount Emu She-oaks (*Allocasuarina emuina*) in order to meet EPBC Act approval conditions. The project involves high level management of civil contractors and subcontractors, workplace health and safety and environmental aspects. Project works included:

- + Detailed population surveys within the impact area
- + Preparation of a receival area including weed and soil assessments, earthworks and fencing (including wildlife passage infrastructure)
- + Seed collection from the impacted population prior to translocation for nursery propagation

- + Translocation of 1.2ha of coastal heath vegetation utilising the heath tile methodology, with a further 200 individual *Allocasuarina emuina* plants moved by hand or excavator
- + Post-translocation management and maintenance including a rigorous watering regime, weed control and plant health assessments
- + Planting of over 200 nursery grown plants to supplement loss and enhance the population
- + Ongoing monitoring of the receival area inclusive of BioCondition, population count surveys, photo monitoring and more.



Glenview Koala Offset Project

FPE manages a Koala offset property related to the Caloundra Road to Sunshine Motorway Bruce Highway Upgrade, and undertakes actions outlined in the Offset Management Plan to enhance Koala habitat on a 52 hectare bushland property in Glenview. The aims of the project are to improve vegetation condition, enhance the use of the site by Koala's and secure Koala habitat in the long term. The scope of works for this project includes:

- + Baseline and annual Koala monitoring utilising the Spot Assessment Technique and Koala detection dogs

- + Baseline and annual habitat monitoring (Biocondition methodology)
- + Weed control and monitoring
- + EVNT flora population surveys
- + Development of a Fire Management Plan and the planning and implementation of a low intensity ecological burn
- + Pre-burn fauna habitat inspections, mapping and management and Koala drone surveys.



Maroola Dune Revegetation Project

FPE provides coastal dune revegetation services including habitat restoration planting, civil works and management. Detailed review of the Vegetation Management Plan and rehabilitation strategy was required. FPE developed a Wallum Frog Habitat Management Plan to identify management requirements to mitigate risk of impact of Wallum Froglets during clearing and guide site preparation, construction, revegetation and maintenance phases. FPE's works included:

- + Development, design and construction of compensatory frog ponds

- + Assisted natural regeneration and revegetation of a 700m strip of coastal sand dune, including planting of 6000 native tubestock
- + Ongoing management and maintenance of revegetated areas and frog ponds (weeds, watering etc.)
- + Monitoring of ponds for frog activity and water quality
- + Success assessments of ponds and revegetation plantings against performance criteria.



Bio-Retention Basin Refurbishment and Rehabilitation

FPE undertook the remediation and rehabilitation of an existing bio-retention basin that had become contaminated with hydrocarbons. The bio-retention basin required refurbishment to meet the design performance criteria to capture stormwater runoff and provide natural water quality improvement prior to water entering stormwater networks and receiving aquatic ecosystems. The scope of work for this particular project included:

- + Stripping of existing vegetation
- + Removal of contaminated soils and water via licenced waste removalist
- + Replacement of the filter medium
- + Reshaping works and stabilisation of batter surfaces
- + Planting and landscaping with appropriate tubestock species.



Quarry Rehabilitation Project

FPE prepared rehabilitation plans and plans of management for numerous local government operating and closed quarries in NSW to meet compliance with environmental licences. The landscapes assessed ranged from moderately disturbed to severely degraded, posing a myriad of rehabilitation challenges. FPE delivered the following services:

- + Detailed environmental site assessments of each quarry
- + Overarching Plans of Management for both operational and closed quarries
- + Rehabilitation plans
- + Erosion and sediment control plans
- + Stormwater management plans
- + Contamination management advice.

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FPE provides an extensive range of land management services to address **contamination, remediation and validation** projects



WE SPECIALISE IN THE PROVISION OF THE FOLLOWING SERVICES

Site Contamination Assessment

- + Preliminary (desktop) site investigations
- + Detailed site contamination investigations
- + Suitably Qualified Person (SQP) and Contaminated Land Auditor (CLA) management
- + Site characterisation & validation of soil sampling
- + Acid Sulfate Soil (ASS) sampling
- + Water (surface and groundwater) contamination investigations
- + Vegetation poisoning sampling and assessment
- + Site inspections, training and auditing
- + Risk assessments & site-based management plans.

Contaminated Land Remediation & Validation

- + Remediation design, management & action plans
- + Soil, surface water and groundwater remediation
- + Asbestos investigation and testing, airborne fibre monitoring, asbestos clearance certificates and asbestos management plans
- + Acid Sulphate Soils (ASS) management & treatment
- + Underground storage tank removal
- + Soil Disposal Permit Applications
- + Contamination management & disposal
- + Bio-remediation
- + Validation of remedial works.

Landfill Monitoring & Management

- + Groundwater, surface water & leachate monitoring
- + Landfill gas (Methane, Oxygen Carbon Dioxide, Hydrogen Sulphite) monitoring
- + Rainfall event monitoring
- + Dust & noise monitoring
- + Management plans & database administration.

Wastewater & Effluent

- + Site and soil evaluation
- + Land suitability and feasibility studies
- + On-site wastewater treatment plant & disposal system design
- + MEDLI modelling
- + Recycled water, irrigation, drinking water quality and site-based management plans
- + Compliance environmental monitoring and reporting (surface water, groundwater & soil).

Erosion & Sediment Control

- + Design & documentation of erosion and sediment control plans
- + Construction management services
- + CPESC/RPEQ auditing and compliance
- + Site environmental ESC monitoring and verification
- + Site supervision, representation and reporting.

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KEY PROJECTS



Aquatic and Recreation Centre Contamination Remediation

FPE undertook contaminated land investigation and remediation works during the development of the Gympie Aquatic and Recreation Centre. The development was constructed on a former Council depot site previously used for workshop activities as well as underground and above ground fuel storage. FPE provided professional contaminated land investigation and management services during planning, construction and operational phases of the project, which included the following elements:

+ Stage 2 Detailed Site Investigation;

- + Preparation of a Remediation Plan and Construction Environmental Management Plan;
- + Bulk earthworks supervision and contamination management during the construction project;
- + Preparation of Site Investigation and Validation Reports and draft Site Management Plan for review and certification by the Contaminated Land Auditor.



Landfill Environmental Monitoring Projects

FPE has worked extensively in environmental monitoring for a number of Councils on operating and closed landfill sites across Australia's east coast. Most recently for Noosa Council at Eumundi Landfill and for the City of Canterbury Bankstown for Kelso Waste Management Centre and Saltpan Creek Closed Landfill. FPE has played key roles in developing Receiving Environmental Monitoring Plans and other key contamination management functions. In conjunction with meeting compliance with site-specific approvals, FPE's scope of works includes:

- Scheduled groundwater, surface water and leachate monitoring;
- Surface and sub-surface landfill gas monitoring;
- Emergency event water monitoring following rainfall events which result in surface water runoff off-site and discharge from High-Efficiency Sediment (HES) basins;
- Due-diligence reporting of environmental conditions on-site;
- Management of database, and analysis of results against relevant guidelines and licence conditions;
- Scheduled compliance reporting.



Caloundra Road to Sunshine Motorway Interchange Upgrade

FPE performed a wide range of environmental services including baseline water quality monitoring, contaminated land investigation, wastewater assessment and design, and provision of independent CPESC consultant for verification of ESCP during construction. Works included:

- + Baseline water quality monitoring prior to construction including programmed sampling and the installation and monitoring of in situ telemetry water quality loggers;
- + Contaminated land investigation, remediation and validations of the former workshop;

- + Wastewater design & management for various site offices;
- + Verification of ESCP through preliminary and detailed design;
- + On-site monitoring of contractors ESCP implementation.



Northeast Business Park Project

FPE undertook an acid sulphate soil investigation and prepared an ASS management plan for Phase 1 of a large residential project that included upgrades to roads, trunk water, sewer mains, and stormwater services. The site was located in a sensitive environmental area adjoining mangroves and tidal creeks. Works included:

- + ASS investigation, sampling and analysis;
- + ASS Management Plan;
- + Installation of a groundwater well monitoring network;

- + Baseline groundwater monitoring program;
- + Groundwater monitoring during civil works construction.

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FPE provides an extensive range of environmental services for **monitoring and managing freshwater, estuary and marine ecosystems.**



WE SPECIALISE IN THE PROVISION OF THE FOLLOWING SERVICES

Coastal & Waterway Management & Planning

- + Environmental impact assessments
- + Environmental Management plans for:
 - + Coastal water quality
 - + Shoreline erosion
 - + Acid sulfate soils
 - + Erosion and sediment control and more
- + Environmental monitoring planning, including:
 - + Sampling analysis plans (water and sediment quality)
 - + Aquatic fauna & flora (including benthic) monitoring & management plans
- + Coastal hazard assessments & contingency planning
- + Assessments against environmental legislation and negotiation with regulators
- + Development applications and approvals for works in a coastal management district, tidal works or waterway barrier work approvals and marine plant permits.

Marine, Estuarine & Freshwater Ecosystem Assessment

- + Smooth to open water telemetry based water quality monitoring
- + Vessel based water quality sampling and analysis
- + Aquatic health & macro-invertebrate surveys
- + Stream and fish habitat surveys
- + Marine and aquatic plant vegetation assessments
- + Freshwater & marine fauna surveys
- + Sediment analysis, monitoring and management
- + Coral reef & seagrass monitoring
- + Surface, groundwater and effluent quality monitoring
- + Erosion and beach nourishment assessments
- + Stormwater management
- + Acid sulphate soil investigation.

Environmental Data & Monitoring Solutions

- + Real-time water quality monitoring Buoys:
 - + Designs for sheltered coastal waters through to open oceans
 - + Multi-parameter data loggers (including turbidity, pH, benthic photosynthetically active radiation, temperature, pressure and sedimentation)
 - + Variable monitoring depths (seafloor to the surface)
 - + Real-time data collection, verification and interpretation via cloud-based services
 - + Automated notifications via a secure website, email and/or SMS
- + In situ Water Quality Monitoring Data Loggers:
 - + Deployable within freshwater ecosystems through to sheltered coastlines
 - + Multi-parameter physicochemical logging;
 - + Easily upgradable to real-time telemetry systems using standard cellular networks, radio repeaters or satellite modem.

Aquatic Salvage & Relocation

- + Pre-dewatering/clearing surveys and habitat assessments
- + Development of Aquatic Salvage Management Plans
- + Design and implementation of threatened aquatic species management programs
- + Destocking of water bodies including electrofishing and trapping methodologies
- + Capture, safe handling/storage, identification and relocation of aquatic species
- + Monitoring of water quality during dewatering/destocking
- + Recording keeping that complies with permit requirements.

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KEY PROJECTS



Rosslyn Bay Boat Harbour Monitoring Project

FPE played a vital role in the environmental monitoring and assessment of ecological receptors during the Rosslyn Bay boat harbour maintenance dredging campaign undertaken by the Department of Transport and Main Roads. FPE designed, deployed and managed real-time water quality monitoring buoys which utilised innovative technologies to report hourly readings on water quality throughout the project. The system provided an accurate portrayal of water quality directly influencing benthic ecosystems.

Environmental services included:

- + Monitoring buoys measuring turbidity, photosynthetically active radiation (light) and sedimentation rates within the bottom 1m of the water column;
- + Vessel based water quality sampling and analysis (including disposal site plume mapping);
- + Benthic infauna assemblages and particle size distribution monitoring;
- + Coral reef monitoring pre and post dredging.



Cooroy to Curra, Section A, Bruce Highway Upgrade Project

FPE designed, implemented and maintained a rigorous monitoring program of three natural creek systems that crossed the road alignment pre, during and post-construction, including fourteen in situ water quality logging stations, aquatic health surveys, fish passage surveys and aquatic salvage activities. Additionally, we conducted an extensive frog monitoring program for *Mixophes iteratus* (Giant Barred Frog) in accordance with the EPBC Act Approval. A summary of the services we provided for this project is outlined below:

- + Fourteen in situ water quality logging stations monitoring turbidity conditions up and downstream of the Bruce Highway in Six Mile, Cooroy and Skyring Creek;

- + Monitoring trends in aquatic health utilising AusRIVAS methodology through stream habitat baseline surveys, regular macroinvertebrate sampling and monitoring of physical water quality parameters;
- + Targeted nocturnal surveys for Giant Barred Frog across numerous transect locations;
- + Fish passage assessments utilising fyke netting to inform waterway barrier works approvals;
- + Fauna Spotter-Catcher supervision and management during construction activities including pre-clearance habitat assessments, aquatic salvage during dewatering and more.



Boat Ramp Upgrade Projects

FPE has conducted environmental scoping assessments for a plethora of boat/barge ramps, and associated infrastructure, upgrade projects across Queensland for both beach and river access. These works are adjacent to sensitive environmental receivers, including mangroves, fish habitat areas, protected marine parks, seagrass and inshore coral communities, turtle nesting areas, and more, requiring detailed environmental impact assessments management. Projects included the following services:

- + Detailed desktop assessments and identification of key environmental risks;
- + Site assessments including mapping of marine plants, seagrass, coral, fauna habitat and more;

- + Environmental scoping reporting and preparation of Environmental Management Plans (Marine planning);
- + Design of monitoring programs if required (water, sediment, ecological);
- + Site contamination & ASS investigations
- + Prescribed tidal works assessment and submission to regulatory bodies;
- + Turtle and shorebird assessments and monitoring;
- + Protected plant & marine plant survey/mapping.



Caboolture Creek Bridge Upgrade Project

FPE undertook an aquatic ecology investigation at Caboolture Creek to support the single-lane timber bridge's replacement to address increased usage and safety concerns raised by the local community. The surveys were completed to provide supporting information for an operational works application of raising a waterway barrier works under the *Planning Act 2016*. Determine if any conservation significant species were present and complete a significant residual impact assessment to ascertain whether offsetting would be required.

FPE designed and implemented a targeted field survey, inclusive of the following:

- + Completion of a detailed desktop assessment to determine likely aquatic species within the system;

- + Deployment of passive fyke nets and box traps that were left fishing overnight at three sites (at the impact site and up and downstream) to sample fish assemblages;
- + Identification and counting of all ray-finned fish, freshwater turtles and malacostracans captured during passive sampling;
- + Completion of nocturnal spotlighting and dipnet surveys targeted at detecting the presence of the Endangered Swamp Crayfish, and its habitat;
- + Habitat assessments of in-stream and riparian characteristics and vegetation utilising the AusRIVAS methodology;
- + Monitoring of physical water quality parameters at each survey location;
- + Delivery of an Aquatic Ecology Survey Report.

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